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An Investigation of the Psychometric Properties and Factor Structure of the Attention-Deficit Hyperactivity Disorder Symptoms Rating Scale for Children and Adolescents

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AN INVESTIGATION OF THE PSYCHOMETRIC PROPERTIES AND FACTOR STRUCTURE OF THE ATTENTION-DEFICIT/HYPERACTIVITY DISORDER SYMPTOMS RATING SCALE FOR CHILDREN AND ADOLESCENTS

by

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ABSTRACT

An Investigation of the Psychometric Properties and Factor Structure

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Rating Scale for Children and Adolescents

by

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Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most frequent problems for which children are referred to mental health clinics in the United States, affecting approximately 3-5% of the childhood population. Although adequate assessment and identification of this disorder is imperative, most of the currently existing rating scales available to assess for ADHD in the childhood population are inadequate. The present research study involved the investigation of the factor structure and psychometric properties of a new behavior rating scale, the ADHD Symptoms Rating Scale (ADHD-SRS), developed for the assessment of ADHD in the school-age (K-12) population.

The participants in this study were 753 children and adolescents (in grades K-12) who were rated by their parents and/or teachers on behavior rating scales designed to

measure ADHD characteristics. The results of this research indicate that the ADHD-SRS possesses strong internal consistency. Convergent validity of this instrument was also high, as demonstrated by correlations with two previously validated behavior rating scales. Significant age and gender differences in ADHD symptoms were found with both the parent and teacher respondent populations. The temporal stability of this measure with teacher ratings was low, as was the correlation between parent and teacher ratings of the same children with this instrument. Finally, the factor analysis of the ADHD-SRS suggested a two-factor oblique rotation as the best fit for both the parent and teacher data. After a visual inspection of the items that loaded on each factor, Factor 1 was named Hyperactive-Impulsive and Factor 2 was named Inattention. These two factors, along with the items that loaded on each factor, appear to be remarkably similar to the two categories listed in the DSM-IV for ADHD. Directions for future research, as well as clinical implications and limitations of the current study, are discussed.

(146 pages)

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CHAPTER I

INTRODUCTION

It has been estimated that approximately 3-5% of the childhood population has Attention-Deficit/Hyperactivity Disorder (ADHD; Barkley, 1990; Burnley, 1993; Fowler, 1991). Without proper identification and treatment, ADHD is a disability that can have serious and long-term complications for the individual (Fowler, 1991). Thus, adequate assessment and identification of the disorder is imperative.

The most frequently used assessment methods for the identification of ADHD include interviews, behavioral observation, cognitive tasks, and behavior rating scales (Barkley, 1990; Guevremont & Barkley, 1992). Interviews, observational methods, and attentional and cognitive tasks, however, have been found to have many problems when used for the assessment of ADHD in children. Behavior rating scales have been found to offer numerous advantages over the other assessment methods (Barkley, 1990; Sleator, 1986).

Unfortunately, most of the currently existing behavior rating scales are inadequate for assessing ADHD. Many of the rating scales have unreported or inadequate psychometric properties, including reliability and validity (Reid, Maag, & Vasa, 1993). Some of the rating scales focus on other disorders along with ADHD, which may not generate a complete and in-depth assessment of ADHD and could lead to confusing results when the primary referral issue is ADHD symptomatology.

Another problem with currently existing behavior rating scales is that few of them were developed after the publication of the Diagnostic and Statistical Manual of Mental

Disorders-Fourth Edition (American Psychological Association, 1994), a major diagnostic tool in the assessment of ADHD (Perkins, 1994). The data support changes made from the Diagnostic and Statistical Manual of Mental Disorders-Third Edition-Revised (American Psychological Association, 1987) to the DSM-IV (APA, 1994), which differentiates between hyperactive-impulsive and inattentive type disorders and also altered and added new behavioral descriptors to the diagnostic criteria (Sabatino & Vance, 1994). Whereas the criteria for ADHD found in the DSM-IV (APA, 1994) are essential for the proper identification of ADHD in children, few of the currently existing norm-referenced behavior rating scales are based on these criteria. Thus, it is imperative that new instruments using the DSM-IV (APA, 1994) as a guideline for item inclusion be developed for the assessment of ADHD in children.

The purpose of this research was to evaluate the factor structure and psychometric properties of a new behavior rating scale developed for the assessment of ADHD in children, the ADHD Symptoms Rating Scale. As a step toward meeting this goal, previous research was conducted to develop the behavior rating scale and to obtain content validation for the items included in the scale. The items that were generated for the behavior rating scale used the criteria listed in the DSM-IV (APA, 1994) as a guideline for item inclusion and format (Holland, 1997).

Purpose and Objectives

The primary purpose of this research project was to evaluate the psychometric properties and factor structure of a new parent and teacher behavior rating scale

developed for the assessment of ADHD in children in grades K-12, the ADHD Symptoms Rating Scale. Specifically, the objectives of this research were: (a) to obtain a preliminary normative sample of both parent and teacher ratings of child behavior with this scale and (b) to obtain reliability and validity evidence for this measure.

Research Questions

1. What are the descriptive statistics in the preliminary standardization sample for both parent and teacher responses?

2. What is the concordance of parent and teacher ratings of the same children with this measure, as demonstrated by correlations of parent and teacher related total scores?

3. Are there significant gender differences as demonstrated by parent and teacher responses on this instrument?

4. What is the effect of children's ages on the ADHD-SRS scores for parent and teacher respondents?

5. What is the internal consistency reliability of this behavior rating scale with parent and teacher respondent populations?

6. What is the temporal stability of this measure at a short-term (2-week) time interval with teachers?

7. What is the underlying factor structure of this instrument for both parent and teacher respondent population ratings based on exploratory factor analyses?

8. What is the relationship of the factor structure obtained through exploratory

factor analyses to the DSM-IV (APA, 1994) categories for ADHD?

9. What is the convergent validity of this instrument as demonstrated by correlations with two previously validated behavior rating scales?

CHAPTER II

REVIEW OF RELATED LITERATURE

In the literature review that follows, topics relevant to understanding ADHD in the childhood population and the assessment of the disorder will be discussed. These topics include: (a) primary and associated problems of ADHD for children, (b) the etiology of ADHD, (c) gender differences in ADHD, (d) the influence of culture/ ethnicity on ADHD symptoms, (e) age-related differences in ADHD, (f) a review of various assessment methods used in the identification of childhood ADHD, (g) a review of frequently administered ADHD behavior rating scales, (h) the differences between the DSM III-R (APA, 1987) and DSM-IV (APA, 1994) criteria for ADHD, and (i) the process of instrument development.

ADHD is one of the most frequent problems for which children are referred to mental health clinics in the United States, constituting up to half of the referrals to outpatient clinics (Cohen, Becker, & Campbell, 1990; Frick & Lahey, 1991). It is estimated that approximately 3-5% of the childhood population has ADHD (Barkley, 1990; Burnley, 1993; Fowler, 1991; McBurnett, Lahey, & Pfiffner, 1993), though some studies have reported an even higher incidence (Ross & Ross, 1982; Silver, 1992; Whitman, 1991).

ADHD Defined

The DSM-IV (APA, 1994) defines ADHD as "a persistent pattern of inattention

and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development" (p. 78). These two broad areas of inattention and hyperactivity-impulsivity each consist of nine different symptoms within the DSM-IV. In the category of inattention, six or more of the following symptoms must be present and have persisted for at least 6-months duration to a degree that is maladaptive and inconsistent with developmental level: (a) difficulty sustaining attention in play or tasks, (b) not following through on instructions and failing to finish work or chores, (c) not seeming to listen when spoken directly to, (d) difficulty organizing tasks and activities, (e) avoiding or disliking tasks that require sustained mental effort, (f) failing to give close attention to details or making careless mistakes in work or activities, (g) distracted, (h) losing things, and (i) forgetful. In the category of hyperactivity- impulsivity, six or more of the following symptoms must have persisted to a degree that is maladaptive or inconsistent with developmental level for at least 6 months: Hyperactivity: (a) leaving seat, (b) fidgeting with hands or feet or squirming in seat, (c) running about or climbing excessively, (d) "on the go" as if "driven by a motor," (e) difficulty playing quietly, and (f) talking excessively. Impulsivity: (a) difficulty awaiting turn, (b) blurting out answers before questions have been completed, and (c) interrupting or intruding on others. These symptoms must be causing impairment in at least two settings (i.e., home and school), and there must be clear evidence that the symptoms interfere with appropriate academic, social, or occupational functioning. The symptoms cannot be better accounted for by another mental disorder. Also, the appropriate subtype should be noted (i.e., ADHD, Combined Type; ADHD,

Predominantly Inattentive Type; or ADHD, Predominately Hyperactive-Impulsive Type) based on the predominant symptom pattern over the past 6 months (DSM-IV; APA, 1994).

Correlates of ADHD

In addition to the primary symptomatology of inattention, impulsivity, and hyperactivity, children with ADHD often experience other difficulties. One such difficulty is poor academic performance, with almost all clinic-referred children for ADHD typically underachieving in relation to their known ability levels as predicted by their intelligence, age, and achievement test scores (Barkley, 1990; Durbin, 1993). In a study by Reardon and Naglieri (1992), it was found that the cognitive competence of children with ADHD is severely impaired by their inability to attend to relevant stimuli and by their significant difficulty in formulating plans due to their impulsiveness. It has been conservatively estimated that approximately 19-26% of children with ADHD have at least one type of learning disability in either reading, spelling, or math (Barkley, 1990; Silver, 1992). If such a disability is defined more loosely to include other areas of learning, this prevalence rate may jump to as many as 80% of all children with ADHD also having a learning disability (Barkley, 1996). As many as 40% of children with ADHD have received some type of special education assistance by the time they reach adolescence (Barkley, 1996). Children with ADHD have also been found to have problems in their speech and language development (Barkley, 1990).

Significant problems with oppositional and defiant behaviors, aggressiveness, and

antisocial behaviors are very prevalent in children with ADHD, with 35-60% of all ADHD clinic-referred children also meeting the criteria for Oppositional Defiant Disorder (Barkley, 1990; Frick & Lahey, 1991). Satterfield, Hoppe, and Schell (1982) found that there was a strong relationship between childhood ADHD and later arrests for delinquent behavior. Their results indicate the delinquency rate (as defined by official arrests) in the ADHD group to be 36-58% of their sample of 110 adolescent males with ADHD (Satterfield et al., 1982). The rates of comorbidity between ADHD and Conduct Disorder in children and adolescents have been estimated to range from 41-75% (Frick, Strauss, Lahey, & Christ, 1993). Evidence also exists that the presence of conduct disorders puts children with ADHD at risk for later alcohol abuse (Frick & Lahey, 1991; Weiss & Hechtman, 1986).

Children with ADHD tend to have many peer relationship problems (Frick & Lahey, 1991) and tend to be unpopular or rejected by their peers because they are often inattentive, disruptive, socially immature, and provocative (Barkley, 1990; Frick & Lahey, 1991). It has been estimated that as many as 60% of children with ADHD experience social rejection (Guevremont & Barkley, 1992). Children with ADHD also tend to elicit negative interactions with their parents and teachers as a result of their behavior (Guevremont & Barkley, 1992). Poor self-esteem and emotional disorders may emerge as a result of chronic failure and conflict in family and social functioning (Frick & Lahey, 1991). Comorbidity between ADHD and other emotional and behavioral disorders is common, with 44% of children with ADHD having at least one other psychiatric disorder (Barkley, 1990).

Etiology of ADHD

Many potential explanations for ADHD symptomatology have been proposed over the past few decades (Hinshaw, 1994). In a review of the literature conducted by Goodman and Poillion (1992), 38 causative factors were cited for ADHD in the 25 sources reviewed. Many of the past proposed etiologies for ADHD, such as food additives or fluorescent lighting, have been discredited (Goldstein & Goldstein, 1992; Reid et al., 1993). Although much of the research has remained inconclusive, the factors of genetics, neurobiology, and environment all appear to play a potential role in the etiology of ADHD.

The relationship between ADHD and heredity has been established (Goldstein & Goldstein, 1992). First-degree relatives of clinically referred children for ADHD have been found to have a significantly higher risk for having ADHD than do the relatives of children without such problems (Faraone, Biederman, Keenan, & Tsuang, 1991; Frick & Lahey, 1991). It is now estimated that a child with ADHD is four times as likely as a child without ADHD to have other family members with ADHD (Goldstein & Goldstein, 1992). Twin studies have evidenced an increased prevalence of ADHD. Results of a study conducted by Gillis, Gilger, Pennington, and DeFries (1992) indicate that ADHD is highly heritable, with probandwise concordance rates for ADHD at 79% for identical twins and 32% for fraternal twins.

Despite failures to replicate many laboratory studies with respect to psychobiological influences on ADHD, various psychophysiological findings intimate

some central nervous system mechanism involvement in the development of ADHD (Barkley, 1989). Catecholamine function and its modulation are likely to be involved in the etiology of ADHD. Evidence from known actions of successful pharmacologic treatments of ADHD points to the monoamines dopamine and norepinephrine and the indoleamine serotonin as potential mediating neurotransmitters (Zametkin & Rapoport, 1987). Though it is generally accepted that Methylphenidate's (Ritalin) effectiveness appears to stem from its effects in the dopaminergic system, studies with children who have ADHD have failed to demonstrate a dopamine deficit in ADHD. This failure may be due to both the variability in localization and generalization of dopamine deficits, or because some attentional deficits may be due to alterations in cortical inhibition systems or basal brain arousal that primarily reflect the effect of other neurotransmitters besides dopamine (Hunt, Mandl, Lau, & Hughes, 1991). Reduced efficiency of glucose metabolism also has been found in some individuals with ADHD (Hinshaw, 1994). Temporal lobe damage has been shown in some studies to cause hyperactivity, though it may account for fewer than 5% of cases (Houlihan & Van Houten, 1989). Though many of these findings are encouraging, the central nervous system is so complex that implicating just one neurotransmitter in the etiology of ADHD is likely to be overly simplistic and improbable (Hinshaw, 1994).

Finally, there is some evidence that the environment may interact with genetic and psychobiological causative factors to worsen or reduce ADHD symptomatology (Frick & Lahey, 1991). Discordant familial interactions appear to be an escalating or maintaining factor in families with a child with ADHD (Hinshaw, 1994). Increased family

functioning, on the other hand, may reduce ADHD symptomatology in some children (Frick & Lahey, 1991). Other environmental factors, such as the ingestion of certain medications or lead, may also be related to the exacerbation of ADHD (Houlihan & Van Houten, 1989).

In sum, the most current theory for the etiology of ADHD involves the complex interplay of heredity, biology, and environment (Hinshaw, 1994). Though investigators may endorse a genetic or biological predisposition to the disorder, it appears as though the symptoms of ADHD remain malleable to environmental and social learning influences (Barkley, 1989).

Gender Differences in ADHD

Throughout the literature, prevalence rates indicate that boys are approximately three times more likely to be diagnosed with ADHD than girls (Barkley, 1990; Brown, Madan-Swain, & Baldwin, 1991). In clinic-referred populations, the male-to-female ratio rises up to 9:1, respectively, which suggest that boys with ADHD are far more likely to be referred to clinics for evaluation and treatment than girls (APA, 1994; Barkley, 1996). However, the few studies that have investigated gender differences in childhood ADHD symptomatology have yielded differing results (Brown et al., 1991). In a study conducted by Brown et al. (1991), it was found that girls with ADHD were retained in school more frequently than boys, were more underidentified than boys, and were less aggressive than their ADHD male counterparts. Few gender differences, however, were obtained on measures of concentration and attention, intellectual functioning, academic

achievement, distractibility, parent and teacher ratings of internalizing and externalizing behavioral symptoms, and social competence (Brown et al., 1991). Silverthorn, Frick, Kuper, and Ott (1996) also found no differences across gender on measures of neurological and cognitive status. In a study of situational variability conducted by Breen and Altepeter (1990), no clear gender differences were found in children identified as ADHD. Barkley (1990) noted that, in general, girls may have fewer conduct problems and may be less aggressive than boys, but otherwise appear to be little different in their pattern of ADHD symptoms. In general, it appears as though the results of the literature are somewhat inconclusive about the role that gender plays in ADHD, and more research must be conducted in order to more clearly define the differences between males and females with ADHD (Faraone et al., 1991).

Cultural/Ethnicity Influences on ADHD Symptoms

Traditionally, there has been a consistent neglect of research conducted toward the exploration of the possible influences of ethnicity on ADHD symptomatology (Langsdorf, Anderson, Waechter, Madrigal, & Juarez, 1979). Both ADHD as a disorder and the instruments designed to assess for ADHD were developed from the Western perspective and did not take into account cultural or ethnic differences (Reid, 1995). Such a void in the literature regarding cultural and ethnic difference may lead to the unfounded assumption that ADHD is uniformly distributed and diagnosed across ethnic groups (Langsdorf et al., 1979), even though there are insufficient data to support such an assumption. In more recent years, however, effort has been put into researching the

question of how ADHD presents as a disorder in different ethnic and cultural groups.

In a study conducted by Luk and Leung (1989), it was determined that the Conners' Teacher Rating Scale (CTRS-39) could differentiate between Hong Kong Chinese school children with and without ADHD. Kanbayashi, Nakata, Fujii, Kita, and Wada (1994) found an overall ADHD prevalence rate of 7.7% in their sample of 1,022 Japanese children. Using parent ratings of the DSM III-R (APA, 1987) items, 13.7% of boys in the 7-9 age range exhibited the highest scores of ADHD, followed by boys in the 4-6 age range at 12.6%, and boys in the 10-12 age range at 5.5%. In the 4-6 age group, 7.9% of Japanese girls in this sample exhibited the highest scores of ADHD, followed by 2.5% of Japanese girls in the 7-9 age group, and 2.3% in the 10-12 age group (Kanbayashi et al., 1994).

Some studies have also been conducted in researching differences of ADHD diagnosis rates among ethnic groups within the United States. Langsdorf et al. (1979) found that African American children were overrepresented as having ADHD, while Hispanic children were underrepresented in many instances. Almost 25% of the African American children in their sample were rated as having ADHD, while only 8% of the Hispanic children were identified (it is important to note that an overall incidence rate of 15% for ADHD was found in their study). The lowest frequency figures for ADHD in this study were found in middle income white communities, while the highest ADHD incidence rates were found in black and Hispanic lower socioeconomic neighborhoods. Their results suggest that both the ethnicity and social economic status of the child may be important factors which could influence teacher ratings on ADHD behavior rating

scales (Langsdorf et al., 1979). Thus, children in these ethnic minority groups or lower SES communities may receive inflated or inaccurate diagnoses of ADHD.

Although no information was found in a comprehensive literature search of PSYCHLIT on how Native Americans exhibit ADHD symptomatology, some inferences can be made based on the literature regarding the counseling of Native Americans. Sue and Sue (1990; as cited in Merrell, 1994) noted that traditional Native Americans tend to speak softly and slowly and are more likely to interject less and offer little encouraging information in a conversation. In addition, Native Americans often make infrequent eye contact when speaking or listening to someone, as in their culture, this is a sign of aggressiveness (Attneave, 1987). However, these behaviors may be interpreted by a teacher as an inability to sustain attention in the classroom. Thus, the Native American child may potentially be rated highly on behavior-rating scale items that measure inattention, thereby acquiring an inaccurate diagnosis of ADHD.

In sum, it appears as though ADHD is a disorder that can be identified in all ethnic groups studied thus far (Barkley, 1996). Obviously research must be conducted with a wider population of culturally diverse individuals (i.e., Native Americans). Unfortunately, it is impossible at this time to determine whether or not these current research findings were contaminated by factors associated with ADHD, such as low SES, psychosocial stressors, and poverty, which are also associated with some cultural and ethnic groups. Future research must control for these extraneous factors in order to establish the actual prevalence of ADHD in different cultures and ethnicities.

Age-Related Differences in ADHD

Much of the literature suggests that ADHD symptomatology changes to some degree as the child with ADHD progresses in age (Barkley, 1990, 1996; Sleator, 1986; Wender, 1987). The symptoms of ADHD often first appear in the preschool years, between the ages of 3-4 years (Barkley, 1996). Children with ADHD at this age level are described by parents as always on the go, restless, acting as if driven by a motor, and frequently getting into or climbing on things. These children often have injuries as a result of these overactive and impulsive behaviors (Barkley, 1990). Preschoolers with ADHD are characterized as having a short attention span, and unable to pay attention to activities for any length of time (Wender, 1987). These preschoolers are also described as being very talkative and noisy (Barkley, 1996).

The hyperactive and impulsive behaviors of the preschool years persist as the child with ADHD enters elementary school. These children, aged 6-12, however, also begin to have difficulties with sustained attention, including forgetfulness, and distractibility (Barkley, 1996). Elementary-age children with ADHD often are restless in their seats, fidgeting and squirming during school or homework time (Wender, 1987). With the increased amount of homework and school supplies to keep track of, elementary-age children with ADHD often are disorganized and do not follow through on many tasks and activities. It is often during this time that the child with ADHD also begins to experience social rejection from both peers and adults (Barkley, 1990).

In adolescence there is often a decline in ADHD symptomatology as reported on

behavior rating scales. However, simply because the severity levels of symptoms may decline with age does not necessarily mean that children with ADHD are outgrowing their disorder (Barkley, 1996). Instead, it is estimated that approximately 50-80% of all clinic-referred children for ADHD will continue to have ADHD symptomatology into their teenage years (Barkley, Fischer, Edelbrock, & Smallish, 1991). The core problems of hyperactivity, impulsivity, and inattention, along with many coexisting associated problems, such as worsening social interactions and school failure, follow some children with ADHD into their adolescent years (Barkley, 1996; Sleator, 1986). As children mature, the symptoms of ADHD usually become less conspicuous. For example, signs of excessive gross motor activity (excessive climbing or running) may be confined instead to feelings of inner restlessness or fidgetiness (APA, 1994). Follow-up studies have also now found that between 30-50% of children with ADHD continue to exhibit ADHD symptoms in adulthood (Silver, 1992; Weiss & Hechtman, 1986). It is thought that adolescents and adults with ADHD may develop adaptive skills to cope with ADHD symptomatology, but that they may still face the same core symptoms of inattention, hyperactivity, and impulsivity.

Assessment of ADHD

Without proper identification and treatment, ADHD is a disorder that can have serious and long-term complications for the individual (Fowler, 1991). Therefore, one of the first steps in helping children who exhibit ADHD symptomatology is to conduct an assessment to detect if the child does have ADHD (Durbin, 1993). Unfortunately, there

is no simple test, such as a urine or blood test, that can detect whether the child has ADHD (Fowler, 1991). A diagnosis of ADHD is typically made by a clinician after comparing the results of various assessment measures against the definitional criteria for the disorder. The most frequently used assessment methods for the identification of ADHD in children are attentional and cognitive tasks, interviews, observational methods, and rating scales (Barkley, 1990; Guevremont & Barkley, 1992). These assessment methods are reviewed briefly below.

Attentional and Cognitive Tasks

Numerous attentional and cognitive tasks have been developed to distinguish children with ADHD from those without this disorder. Three widely studied laboratory measures of attention and impulsivity are the Continuous Performance Test (CPT), the Matching Familiar Figures Test (MFFT), and the Test of Visual Attention (TOVA) (Barkley, 1990). These three tasks, along with the use of the Freedom from Distractibility (FD) index in the Wechsler Intelligence Scale for Children-Revised (WISC-R), will be briefly reviewed in the following paragraphs.

The Conner's CPT requires the child to observe a screen while individual letters or numbers are projected onto it at a rapid pace. The child is told to respond when a specific stimulus or pair of stimuli appear. The child's score is derived through the number of target stimuli missed and the number of responses to incorrect stimuli. Though the CPT is one of the most frequently used laboratory measures for discriminating children with ADHD from those without, most studies have found no

specific differences between ADHD and control groups in performance changes over time (Seidel & Joschko, 1990). In a review of the Conner's CPT, Dumont, Tamborra, and Stone (1995) stated that the manual seems more concerned with theory and history than with validity and reliability. The normative data available for the Conner's CPT is not stratified, no breakdown by age category is offered, and little, if any, information is provided in the manual about education levels, geographic regions, socioeconomic status, or race of the normative group (Dumont et al., 1995). Nigg, Hinshaw, and Halperin (1996) found that the CPT has adequate specificity, but poor sensitivity in identifying individual boys with ADHD. Corkum and Siegel (1993) found in their literature review that there was no clear evidence for the validation of a sustained attention deficit in children with ADHD and that situational, task, and external variables all affect CPT performance. They concluded that, though the CPT may be a valuable research tool, there has not been enough research to indicate that the CPT would be a viable alternative to using behavior rating scales when assessing for ADHD (Corkum & Siegel, 1993) .

The MFFT has a lengthy history of use in research investigating impulse control in children (Barkley, 1990). This measure involves presenting a picture of an object to the child, who must choose the identical matching picture from an array of six similar variants. The child's score is derived from the mean time taken to pick a picture and the total number of correct responses. Recent research, however, has failed to find significant differences between the responses of children with ADHD and normal controls. It also has been shown to have conflicting results in detecting stimulant drug effects in children with ADHD (Barkley, 1990).

The TOVA is a visual attention task that has been frequently used for the screening and assessment of ADHD in children. The TOVA is a 22.5-minute visual continuous performance test administered via computer. Though this task is one of the most frequently used continuous performance tests for the assessment of ADHD, it has been found to possess questionable validity and reliability. The normative data have also been found to be weak with this measure. For example, little, if any, information is provided in the manual regarding how the subjects in the normative group were selected, and as few as four subjects represent certain age groups for the entire country (Ruprecht, 1996).

The FD index from the WISC-R has also been used to assess attention problems in children (Cohen et al., 1990). In a study by Cohen et al. (1990), however, a correlational analysis between the FD index and three developed ADHD rating scales evidenced that FD is not a reliable measure of ADHD, but that rather it may reflect a weak relationship with performance anxiety.

Interviews

Parent and teacher interviews provide information about the child's educational, developmental, and social history and about current life and behavioral concerns (McKinney, Montague, & Hocutt, 1993). An advantage of interviews is that they can provide information about the child beyond the scope of observational measures and rating-scale questions (Barkley, 1990). In-depth interviews can give information about a variety of factors related to the child's behavior and can be used to establish that certain

diagnostic criteria are met (Guevremont, DuPaul, & Barkley, 1993). Several structured interviews are available for diagnosing child psychopathology (Barkley, 1990). However, most of these structured interview formats were not designed for clinical diagnostic use, but instead were developed for research purposes, or for conducting epidemiological studies regarding the prevalence of disorders (Guevremont & Barkley, 1992). The available interview formats have also been shown to have limited validity and reliability (Guevremont & Barkley, 1992). Another disadvantage of interviewing is that it must be conducted by an experienced examiner with careful and thorough training in the process (Barkley, 1990). In general, interviews for diagnosing ADHD should be done with caution and should not be considered as the only assessment method (Guevremont & Barkley, 1992).

Direct Observation

Observational procedures involve the recording of ongoing behavior of a child in a natural or experimental setting (Ross & Ross, 1982). Observational methods most often consist of recording the child's behavior according to categories reflecting common ADHD behaviors (Guevremont & Barkley, 1992). The advantage of observation is that the clinician is able to observe firsthand what behaviors the child exhibits (Barkley, 1990; Ross & Ross, 1982). However, the majority of the literature discourages the use of direct observation as the primary assessment method for ADHD (Barkley, 1990; Blondis, Snow, Stein, & Roizen, 1991; Guevremont & Barkley, 1992; Ross & Ross, 1982). For example, there are difficulties in establishing and maintaining reliability; the various

costs involved outweigh those involved in using a rating scale; there is difficulty in ensuring unobtrusive observations; and there are problems of obtaining adequate samples of behavior from a representative set of environments (Ross & Ross, 1982). The time involved and the investment of trained personnel also remain a drawback (Blondis et al., 1991). In addition, attempting to draw diagnostic conclusions about a child's behavior from a clinic or other related setting is not recommended, as such behavior has been shown to be atypical from the child's behavior with caregivers in natural settings (Barkley, 1990). Overall, direct observation has been recommended as being only one component in the assessment of the child with ADHD (Guevremont & Barkley, 1992).

Behavior Rating Scales

Rating scales offer numerous advantages over the other assessment methods (Barkley, 1990; Sleator, 1986). For example, rating scales permit data collection of infrequent behaviors that are likely to be missed by observations (Barkley, 1990). Rating scales can be used to gather information from those who have for years been responsible for the care and management of the child across different situations and settings (Barkley, 1990; Blondis et al., 1991). Rating scales are also relatively easy to administer and are inexpensive (Ross & Ross, 1982). Rating scales often have normative data available for establishing the statistical significance of the child's behaviors (Guevremont & Barkley, 1992; Guevremont et al., 1993). Finally, rating scales permit the quantification of qualitative aspects of behavior, which are often difficult or impossible to obtain through interviews, cognitive tasks, or direct observation (Barkley, 1990; Sleator, 1986).

Some limitations also exist with the use of rating scales. Two measurement problems that potentially can reduce the accuracy of rating scales are "error variance" and "bias of response." There are four different types of variance that may create error in the results of a rating scale assessment: Setting variance (the situational specificity of behavior), temporal variance (the tendency of behavior ratings to be only moderately consistent over time), source variance (the subjectivity of the rater), and instrument variance (different rating scales measure related, but slightly different constructs). Bias of response also introduces error into rating scale results through the way in which the informant responds to the questions (Merrell, 1994). Four common response sets are error of central tendency, the halo effect, error of leniency, and error of severity. Error of central tendency is caused by the inclination of the rater to rate all subjects observed at the middle of the scale, while the halo effect is the tendency for the observer to rate the subject in a positive manner because he or she possesses a positive trait not related to the behavior being rated. Error of leniency and error of severity occur when raters are overly generous or overly severe and rate most individuals at either the high or low end of the scale, respectively (Borg & Gall, 1989). Although the problems of error variance and bias of response are inherent in using rating scales, there are also effective ways of minimizing these problems (see Merrell, 1994). In general, however, it is the best practice that rating scales not be used alone for making classification or placement decisions, but instead that they be used as part of a multimethod, multisource, multisetting design for obtaining broad-based and aggregated assessment information (Merrell, 1994).

Although rating scales offer numerous advantages, most of the currently existing rating scales are inadequate for assessing ADHD (Reid et al., 1993). Few of the currently existing norm-referenced rating scales used for the assessment of ADHD were developed after the publication date of the DSM-IV (APA, 1994). Thus, these rating scales are not based on the current criteria most commonly used for the diagnosis of ADHD in children. Many of the rating scales have unreported or inadequate reliability and validity (Reid et al., 1993). Finally, some of the rating scales focus on other disorders along with ADHD, which may not generate an in-depth and complete assessment of ADHD and could lead to confusing results when the primary referral issues are specifically related to ADHD.

Review of Specific Behavior Rating Scales

The Conner's Rating Scales have been widely used in the assessment of ADHD. Several versions of the Conner's scale exist (Sleator, 1986). Both the Conner's Parent (CPRS-48) and the Teacher (CTRS-39) Rating Scales have been regarded as having utility for the assessment of childhood ADHD (Barkley, 1989). However, some problems have also been reported with regard to the scales. Barkley (1990) warned that, due to its limited length and item coverage as well as its small normative sample, the CPRS-48 may not be useful for the initial assessment and diagnosis of ADHD. Available reliability and validity information for the CPRS-48 is limited at this time (Barkley, 1990). In a study conducted by Luk and Leung (1989), it was found that the CTRS-39 is inadequate as a screening instrument for the detection of ADHD in the general population. Their results showed that the sensitivity and specificity of the CTRS-39 were unsatisfactory in

that both the rates of false negatives and false positives were too high (Luk & Leung, 1989). Some of the items also measured Conduct Disorder and Oppositional-Defiant Disorder as well as ADHD. Thus, if this scale were used as the primary basis for a diagnosis of ADHD, then children with mood control problems (i.e., tantrums) and defiance could possibly be mistakenly identified as ADHD (Wodrich, 1994).

The ADD-H: Comprehensive Teacher Rating Scale (ACTeRS) is also frequently used in the assessment of ADHD. The ACTeRS was published in 1984 and was revised in 1991. The ACTeRS assesses four basic domains in children's functioning: hyperactivity, social skills, attention, and opposition (Ullmann, Sleator, & Sprague, 1991). However, there is no category for impulsivity, and only one item on the rating scale takes impulsivity into account. Another drawback to this scale is that it is for use only with teachers in a school setting. Also, the validity and reliability information based on several reported studies in the manual is limited and weak (Ullmann et al., 1991).

The Attention Deficit Disorders Evaluation Scale (ADDES) is another rating scale that is commonly used in the detection of ADHD (Barkley, 1990). The scale was published in 1989 (McCarney, 1989), and was revised in 1995. Though the manual reports adequate validity and reliability, there are several problems associated with the ADDES. For example, the ADDES school version reports normative data for students up to age 20, but it is unclear what educational status the 18- to 20-year-old individuals were placed in (i.e., were they considered to still be high-school students?). The ADDES home version used the ACTeRS to establish criterion-related validity. This use was inappropriate, however, as the ACTeRS was originally validated for use with teachers to

describe the behavior of younger children in a school setting, while the ADDES home version was developed to be used by parents with children up to age 20 (Adesman, 1991). The technical manual also states that the ADDES may be used as a screening device for ADD, yet there is no reported validity or utility for the ADDES as a screening measure (Adesman, 1991).

The Child Behavior Checklist (CBCL) by Achenbach is a popular rating scale that is used in the assessment of ADHD and many other childhood disorders (Barkley, 1990). The scale was originally published in 1983, and the scale and manual were revised most recently in 1991 (Achenbach, 1991). The CBCL provides both general and specific information on the nature and extent of a subject's rated emotional, social, and behavioral problems (Merrell, 1994). Despite these strengths, however, the CBCL has been found to be questionable with regards to being used as an assessment tool specifically for ADHD. In a study by Newman, Bobner, Newman, Newman, and Newman (1993), the CBCL was found to have a weak relationship with the DSM III-R (APA, 1987) criteria for diagnosing ADHD. The author did not use the DSM as a guideline for the compilation of items on the CBCL, but instead stated that the "DSM cannot be properly regarded as a criterion for the empirically derived scales" (Achenbach, 1991, p. 88). Thus, it was recommended that if the CBCL is used to make clinical judgment about a diagnosis of ADHD, the results should be interpreted with caution (Newman et al., 1993). Because the CBCL is a broad measure for screening child psychopathology, it is quite lengthy as it incorporates questions for all types of disorders. Thus, this scale can be cumbersome to fill out for one who is primarily interested in assessing a specific disorder, such as

ADHD, in a particular child (Wodrich, 1994). In addition, many of the low rated and severe behaviors are not usually seen in children with ADHD, and these items have been found to be irrelevant and offensive to some parents and teachers when rating a specific child (Merrell, 1994). Adequate reliability and validity were reported for the CBCL, though most of the data reported encompassed all of the disorders on the rating scale as a whole, and not for the attention scale by itself (Achenbach, 1991). In sum, the CBCL is a behavior rating scale that has many strengths, especially as a broad screening method, but its theoretical basis and design render it questionable for use as an ADHD diagnostic tool.

One of the most recently developed rating scales for the assessment of ADHD is the AD/HD Rating Scale-IV developed by DuPaul, Anastopoulos, Power, Murphy, and Barkley (1996). This scale is a questionnaire based on the criteria for ADHD located in the DSM-IV (APA, 1994). This scale replaced a previous scale that was based on the DSM III-R (APA, 1987). Normative data for children and adolescents between the ages of 5 and 18 were obtained from both parent and teacher ratings in a national normative sample. Preliminary research indicates that the scale appears to be reliable and valid for the assessment of ADHD (Power et al., 1996). Because the scale was developed so recently, however, little to no published research has been conducted on the scale. One potential concern with the scale is the fact that the items on the scale are simply the 18 criteria for ADHD found in the DSM-IV (APA, 1994), slightly rewritten for use in a rating scale format. Thus, these items may fail to account for variations in the expression of the disorder. In addition, the AD/HD Rating Scale-IV is not currently commercially available to the average practitioner for use.

Differences Between DSM-IV and DSM III-R

A major diagnostic tool in the assessment of childhood ADHD is the checklist of ADHD characteristics located in the Diagnostic and Statistical Manual provided by the APA (Perkins, 1994). The change in the structure and diagnostic criteria from the DSM III-R (APA, 1987) to the DSM-IV (APA, 1994) is substantiated in the literature (Lahey et al., 1994; Sabatino & Vance, 1994). Diagnostically the 14-symptom ADHD syndrome in the DSM III-R (APA, 1987) was not inclusive enough to adequately explain the full range of complex behaviors that can occur in ADHD. The revisions in the diagnostic criteria in the DSM-IV (APA, 1994; i.e., the clarification and additional behavioral descriptors) should be helpful in the assessment and diagnosis of ADHD (Sabatino & Vance, 1994). In a study conducted by Lahey et al. (1994), the lack of perfect overlap in the diagnostic criteria between the DSM III-R (APA, 1987) and the DSM-IV (APA, 1994) resulted in a net 15% increase in the number of cases identified as ADHD in the DSM-IV (APA, 1994). The broader DSM-IV (APA, 1994) definition of ADHD resulted in the diagnosis of previously unidentified youths as ADHD (Lahey et al., 1994), thus opening the door to needed treatment and services. The DSM-IV (APA, 1994) criteria reduce the heterogeneity of the DSM III-R (APA, 1987) attention-deficit diagnosis in terms of impairment, demographics, and symptoms by differentiating between individuals with their primary dysfunction in inattention, hyperactivity-impulsivity, or both (Bauermeister et al., 1995; Lahey et al., 1994). The DSM-IV (APA, 1994) criteria appear to be more accurate in terms of identifying impaired youth, more consistent with

clinician judgment, and more reliable than the DSM III-R (APA, 1987) criteria (Lahey et al., 1994). Lahey et al. found a small number of patients with impairing levels of symptoms who were identified by the DSM-IV (APA, 1994) criteria but were not identified by the DSM III-R (APA, 1987) criteria. It also appears that the DSM-IV (APA, 1994) diagnostic criteria more accurately identify preschool-age children, as well as girls than do the DSM III-R (APA, 1987) criteria, diagnosing more children in each of these groups (Lahey et al., 1994). Cross-culturally, the dimensions and symptoms listed in the DSM-IV (APA, 1994) for ADHD have been found to be applicable with the Spanish- speaking population as well as English-speaking populations (Bauermeister et al., 1995). Overall, the data support the changes made in the DSM-IV (APA, 1994), which differentiate between hyperactive-impulsive and inattentive type disorders and also altered and added new behavioral descriptors to the diagnostic criteria (Sabatino & Vance, 1994).

Thus far, the importance of assessment of ADHD has been discussed through the review of related literature. Various methods of assessment have been discussed and specific rating scales were reviewed. The importance of the DSM was also highlighted as were the differences of the criteria for ADHD between the DSM III-R (APA, 1987) and the DSM-IV (APA, 1994). The purpose of this investigation was to evaluate the factor structure and psychometric properties of a new parent and teacher behavior rating scale developed for the assessment of ADHD in children grades K-12. Therefore, the process of instrument development, including reliability and validity, is briefly discussed in the following section.

Instrument Development

The jointly produced Standards for Educational and Psychological Testing (AERA, APA, & NCME, 1985) outline the following primary criteria necessary for psychological test development: (a) evidence of validity should be demonstrated, (b) estimates of relevant reliabilities should be described, (c) specifications used in constructing the instrument should be stated clearly, (d) test administration and decision making should be standardized, and (e) tests must be used ethically in the manner in which they were intended to be used. In the following sections, the constructs of reliability, validity, and standardization and norming are described in further detail.

Reliability

Reliability may be defined as the level of stability or consistency of the instrument (Borg & Gall, 1989). Internal consistency and temporal stability are the two primary types of reliability that are extensively discussed in the literature (Cronbach, 1990). Internal consistency can be determined from a single administration of a single form of the instrument. The commonly used methods of computing internal consistency are the split-half method, the Kuder-Richardson method of rational equivalence, and Cronbach's coefficient alpha. The split-half method is calculated by splitting the test into two subtests (i.e., by placing all of the odd-numbered items in one subtest and all the even items in another) and the scores obtained for each of the subtests are correlated. The Kuder-Richardson formula does not require the calculation of a correlation coefficient, but instead requires that items are scored dichotomously. Finally, Cronbach's coefficient

alpha is a general form of the Kuder-Richardson that can be used when items are not scored dichotomously (i.e., in multiple-choice instruments; Borg & Gall, 1989). For most types of tests, Cronbach's alpha is the preferred method of determining internal consistency reliability because it compares all possible comparable parts of the test. It is a specific encompassing type of split-half reliability.

Temporal stability estimates (test-retest reliability) are used to evaluate the error associated with administering a test at two different points in time. The test-retest method involves administering the same test on two well-specified occasions and then calculating the correlation between the scores from the two administrations (Kaplan & Saccuzzo, 1989). The appropriate length of the interval between test administrations is often difficult to determine, though it has been suggested that when assessing children it is desirable to keep the interval short (i.e., under one month) due to rapid developmental changes that may occur (Anastasi, 1988).

Validity

In the jointly produced Standards for Educational and Psychological Testing (AERA et al., 1985), it is stated that "validity is the most important consideration in test evaluation" (p. 9). Validity refers to the extent of how well an instrument measures what it is purported to measure (Anastasi, 1988). Traditionally, validity evidence has been grouped into the following three categories: criterion-related, content-related, and construct-related validity.

Criterion-related validity indicates the effectiveness of a test in predicting an

individual's performance in specified activities. In other words, performance on the test is checked against a criterion, or some behavior or status that the test is designed to measure or predict. Concurrent and predictive validity are both forms of criterion-related validity. Concurrent validity involves obtaining information on the criterion at the time of testing, whereas predictive validity involves obtaining information about the criterion in the future and comparing it with the previous test results (Anastasi, 1988).

Content validity is the systematic examination of the content of a test to determine whether it covers a representative sample of the behaviors one is interested in measuring (Anastasi, 1988). Ideally, a measure should sample all of the important aspects of the behavior domain (Worthen, Borg, & White, 1993). Worthen et al. (1993) offered the following guidelines for obtaining content validation in a measure: (a) clearly describe and specify the domain of behaviors to be measured, (b) subcategorize the behavior domain into more specific content areas, (c) specify the content areas and the relative emphasis on each area, (d) decide how many items to include on the measure, (e) determine how many items will need to be developed for each content area, (f) construct the items, and (g) enlist subject matter experts to review the items. Content validity is actually built into the test with the selection of appropriate items. Content validation of a test is best obtained when the use of subject matter experts are employed (Barrett, 1992).

Finally, construct-related validity is the extent to which the test may be said to measure a theoretical construct or trait. Construct-related validity is a comprehensive concept that includes other types of validity. To demonstrate construct-related validity, information must be accumulated from a variety of sources. Anastasi (1988)

recommended some of the following potential ways of obtaining construct validity: (a) correlations with other tests, (b) internal consistency, (c) convergent and divergent discrimination, (d) experimental interventions (i.e., comparing pre- and posttest scores after treatment), and (e) factor analysis. Typically, construct validity is inferred through a body of related evidence rather than through a single procedure.

Standardization and Norming

Standardization involves controlling the directions, materials, and scoring rules so that a test can be given in the same way by different examiners (Cronbach, 1990). If the scores obtained by different people are to be comparable, the conditions of testing must be the same for everyone. One important step in instrument standardization is the establishment of norms (Anastasi, 1988).

When standardizing an instrument, it is administered to a large representative sample of people for whom it is designed. This group, also known as the standardization sample, serves to establish the normative data. The purpose of the normative data is to provide a reference group with which to compare individual's scores (Anastasi, 1988). Ideally, important variables such as socioeconomic status, ethnicity, gender, and age should be proportionately represented in the normative sample (Borg & Gall, 1989).

Summary

In sum, ADHD is a prevalent disability that can have serious and long-term complications for the individual. Adequate assessment and identification of the disorder

is imperative to ensure proper treatment. Behavior rating scales have been found to offer numerous advantages over other methods designed to assess for ADHD. However, as outlined in this review, most of the currently existing rating scales are inadequate as: (a) they have unreported or inadequate psychometric properties, (b) they may not generate a complete and comprehensive assessment of ADHD as they focus on other disorders along with ADHD, and/or (c) they were not based on the DSM-IV (APA, 1994) criteria for ADHD symptomatology. The purpose of this research was to investigate the factor structure and psychometric properties of a new behavior rating scale developed for the assessment of ADHD, the ADHD Symptoms Rating Scale (ADHD-SRS).

CHAPTER III

METHOD

Participants

The participants in this study were 753 children and adolescents (in grades K-12) who were rated by their parents (N = 513) and/or teachers (N = 240) on behavior rating scales designed to measure ADHD characteristics. A grade-by-gender breakdown of the sample is presented in Table 1. Descriptive data, such as age, ethnicity, if the child has been identified as ADHD, classroom type, special education category (if classified), and site for these subjects, are presented in Table 2.

Instruments

The instruments used in this research included the CTRS-39, the AD/HD Rating Scale-IV (home and school versions), and the ADHD-SRS, a research prototype previously presented in a master's thesis by Holland (1997). The CTRS-39 and the AD/HD Rating Scale-IV were discussed in detail in the Literature Review section of this dissertation and will be briefly described here. The ADHD-SRS developed in Holland's (1997) thesis will be discussed in detail herein.

Conners' Teacher Rating Scale

The CTRS-39 is a 39-item behavior rating instrument. The CTRS-39 rating format involves responding with one of the following four responses to the items:

Table 1

Grade-by-Gender Breakdown for the Subjects = 753)

	Gender		
Grade	Male	Female	Total
K	55	40	95
1	60	55	115
2	54	46	100
3	66	57	123
4	22	28	50
5	27	24	51
6	12	17	29
7	20	23	43
8	1	6	7
9	7	14	21
10	29	26	55
11	17	18	35
12	14	13	27
Total	384	367	751
Missing = 2			

not at all, just a little, pretty much, or very much. This rating scale has six subscales, including Hyperactivity, Conduct Problem, Emotional-Overindulgent, Anxious-Passive, Asocial, and Daydream-Attention Problem. In addition, the scale contains a Hyperactivity Index, a collection of 10 items from the other CTRS-39 subscales that were found to be especially sensitive to pharmacological treatment effects with ADHD children. Sample items for the subscales and the Hyperactivity Index are located in Table 3. The CTRS-39 was normed on over 9,500 Canadian children age 4-12 years. Separate norms are available for both age and gender. Adequate psychometric properties are reported for the scale in the CTRS-39 manual (Conners, 1990).

Table 2

Descriptive Data for the Subjects (N = 753)

Data	Frequency	Percent	Valid percent	Cum percent
Age				
5	37	4.9	5.0	5.0
6	108	14.3	14.6	19.5
7	106	14.1	14.3	33.8
8	102	13.5	13.7	47.6
9	94	12.5	12.7	60.2
10	53	7.0	7.1	67.4
11	42	5.6	5.7	73.0
12	32	4.2	4.3	77.4
13	32	4.2	4.3	81.7
14	7	.9	.9	82.6
15	32	4.2	4.3	86.9
16	49	6.5	6.6	93.5
17	31	4.1	4.2	97.7
18	15	2.0	2.0	99.7
19	2	.3	.3	100.0
Missing	11	1.5		
Ethnicity				
Caucasian	673	89.4	89.4	89.4
African American	10	1.3	1.3	91.2
Hispanic	26	3.5	3.5	94.7
Asian/Pacific Islander	22	2.9	2.9	97.6
Native American	0			
Other	4	.5	.5	98.1
Missing	18	2.4	2.4	100.0
ADHD				
Yes	44	5.8	6.4	6.4
No	607	80.6	80.9	87.1
Don't know	97	12.9	12.9	100.0
Missing	3	.4		

(table continues)

Data	Frequency	Percent	Valid percent	Cum percent
Classroom type				
Regular education	686	91.1	91.9	91.9
Remedial	36	4.8	4.8	96.7
Special education	25	3.3	3.3	100.0
Missing	2	.3		
Special Education				
No	684	90.8	91.1	91.1
Yes	65	8.6	8.7	99.7
Missing	2	.3	.3	100.0
Special education category				
None	689	91.5	91.5	91.5
Learning disabled	18	2.4	2.4	93.9
Speech communication	15	2.0	2.0	95.9
Mentally retarded	2	.3	.3	96.1
Emotional behavioral	2	.3	.3	96.4
Other health impaired	1	.1	.1	96.5
Other	18	2.4	2.4	98.9
Unknown	8	1.1	1.1	100.0
Missing	0			
Site				
Weber School District, UT	307	40.8	40.8	40.8
Westside School District, ID	78	10.4	10.4	51.1
Eureka School District, CA	142	18.9	18.9	70.0
Roseville School District, CA	27	3.6	3.6	73.6
Daviess School District, KY	149	19.8	19.8	93.4
Franklin School District, OH	50	6.6	6.6	100.0
Missing	0			

AD/HD Rating Scale-IV

The AD/HD Rating Scale-IV is an 18-item behavior rating scale based on the DSM-IV (APA, 1994) criteria for ADHD. This scale, developed by DuPaul et al. (1996), is available in both home and school versions. The AD/HD Rating Scale-IV contains two

Table 3

Sample Items from the CTRS-39 Subscales and Hyperactivity Index

Name of subscale	Sample items
Hyperactivity	Restless or overactive, constantly fidgeting
Conduct problems	Destructive; steals; lies
Emotional-indulgent	Demands must be met immediately, easily frustrated; overly senstive
Anxious-passive	Submission; appears to lack leadership
Asocial	Appears to be unaccepted by group; does not get along with same sex
Daydream-attention problem	Daydreams; fails to finish things s/he starts--short attention span
Hyperactivity index	Constantly fidgeting; excitable/impulsive

subscales, the Inattention Scale and the Hyperactivity-Impulsivity Scale, which are summed to calculate the Total Score of the items. Normative data are available for children and adolescents between the ages of 5 and 18 years old (K-12) and were obtained from over 2,000 teachers and 4,500 parents in a national sample. The normative group reportedly closely matched the 1990 U.S. Census data for distribution across regions and ethnic groups. Adequate test-retest reliability (> .75 for 4-week interval) and internal consistency (> .80) has been reported by the authors. Scores of both the home and school version correlate significantly with the CPRS-48 and CTRS-39, and confirmatory factor analyses support the two-factor model that conforms to the DSM-IV (APA, 1994) breakdown of symptoms (DuPaul et al., 1996). Because this scale was

developed recently and remains unpublished, no other additional or confirmatory evidence exists for the psychometric properties of this scale.

ADHD Symptoms Rating Scale

Holland's (1997) thesis resulted in the development of a new research prototype for the assessment of Attention-Deficit/Hyperactivity Disorder in the childhood (K-12) population, the ADHD-SRS. The items were selected using the rational-theoretical approach to test construction (Lanyon & Goodstein, 1982), and the three DSM-IV (APA, 1994) domains of ADHD (inattention, hyperactivity, and impulsivity) were used as a guideline for the selection of descriptors from the literature. Content validation was conducted on the items in the prototype in which expert judges were asked to rate the items in the following three areas: representation of construct, appearance of gender or culture bias, and appropriateness for parent and teacher judgment. This process resulted in 56 final items (see Appendix A). Usability and item-quality ratings were obtained from both a parent and a teacher panel (the population projected to eventually use the prototype clinically). Through the ratings of the panels, a "frequency of behavior" rating format (e.g., "behavior does not occur" to "behavior occurs one to several times an hour") was found to be the desired rating scale format over a "traditional" (e.g., "behavior never occurs" to "behavior often or to a great degree occurs") rating scale format (Holland, 1997).

The ADHD-SRS offers several advantages over many other currently existing rating scales. One obvious advantage is that the items are based on the DSM-IV (APA,

1994) conceptualization of ADHD and its symptomatology. Very few of the currently existing rating scales used clinically for the assessment of ADHD were developed after the publication date of the DSM-IV (APA, 1994). Thus, these rating scales are not based on the current criteria most commonly used for the diagnosis of ADHD in the childhood population. The prototype developed in this research project, however, utilized the specific symptoms listed under the three DSM-IV (APA, 1994) domains for ADHD (inattention, hyperactivity, and impulsivity) as a guideline for item selection. Therefore, the ADHD-SRS has the advantage of having followed the guidelines set by the American Psychological Association for ADHD diagnosis for the assessment of ADHD in the childhood population.

Another advantage of the ADHD-SRS is that it will eventually be used specifically for the assessment of ADHD characteristics in children and youth. Most other commonly used rating scales focus on other disorders along with ADHD, which may cause the child with ADHD to obtain elevations on several scales due to symptom overlap, potentially leading to confusing results when the major referral issue is ADHD. Also, it is likely that these broad-band measures do not generate an in-depth and complete assessment of ADHD as only a few items are devoted solely to this disorder. The ADHD-SRS, however, contains 56 items designed specifically to assess ADHD characteristics in the K-12 population. Thus, it is argued that a more thorough and complete assessment would occur with the eventual clinical use of this research prototype.

Procedure

Data were collected with the assistance of coordinators currently working in public schools (school psychologists and teachers). These individuals were contacted to request that they coordinate data collection in the school district with which they are affiliated. A list of potential coordinators was generated through the author's previous contacts and through the project committee members' brainstorming of potential coordinators. Letters were sent to the coordinators once an initial phone contact was made to determine the interest of the individual in collecting data (see Appendix B). Several incentives were offered to the coordinators for participation, including: (a) the coordinators were paid $5 for each teacher who participated; (b) if the coordinators were NCSP certified, they received continuing NCSP education hours; (c) the coordinator would have unlimited use of the ADHD-SRS until it is published (if that occurs); and (d) if the scale is commercially published, the coordinator will receive complimentary copies of the manual and protocols.

After the individuals agreed to coordinate the data collection, the school districts with which the coordinators were affiliated were contacted and permission was obtained to collect data in those districts. Both phone contacts and written letters were sent to obtain this approval (see Appendix C). For both Weber School District in Utah and Westside School District in Idaho, the author and committee chair went in person to meet with the district superintendent to gain permission to collect data in those districts. Districts in which approval was obtained included: (a) Weber School District in Ogden,

Utah; (b) Eureka School District in Eureka, California; (c) Roseville School District in Roseville, California; (d) Westside School District in Dayton, Idaho; (e) Daviess County School District in Owensboro, Kentucky; and (f) Franklin County School District in Franklin, Ohio.

Following district approval, coordinators contacted teachers in the schools in their districts to request participation. Teachers agreeing to participate were asked to complete rating scales on children in their classes. Data were collected using the ADHD-SRS, The CTRS-39, and the AD/HD Rating Scale-IV, home and school versions. Coordinators were responsible for giving instructions to the teachers for completing the scales. A teacher consent form was constructed to inform the teachers of the purpose of the study, the procedures that were to be followed, the benefits and risks of participating in the study, confidentiality issues, and the voluntary nature of the teacher's participation. The rating scales and specific instructions to the teachers were given to the coordinators before data collection began. A sample teacher packet is located in Appendix D. How many scales each teacher completed and what scales the teachers completed were determined by the author and the project committee members. The following were the possible alternatives: (a) Teachers were asked to complete only the ADHD-SRS. These teachers completed the rating scale on the first three students from their class lists; (b) teachers were asked to complete the ADHD-SRS plus one additional rating scale (the CTRS-39 or the AD/HD Rating Scale-IV, school version). These teachers were asked to complete the rating scales on the first three students from their class lists; and (c) teachers were asked to complete the ADHD-SRS once, and then again 2 weeks later. These

teachers were also asked to complete the rating scales on the first three students from their class lists. All teachers were also asked to complete a child information sheet requesting information such as the child's grade in school, age, sex, ethnicity/race, classroom type (i.e., special education or regular education), if the child had ever been diagnosed with ADHD (to their knowledge), the occupation of the child's parents (if known), and relationship of the rater to the child (in this case, teacher).

In order to simplify data collection, the scales to be completed were divided by school district. The teachers in Weber School District completed the ADHD-SRS and the AD/HD Rating Scale-IV on their students. Teachers in both Eureka and Roseville School Districts completed the ADHD-SRS and the CTRS-39 on their students. Teachers in Westside School District completed the ADHD-SRS once on the first three children on their class list, then again 2 weeks later. Finally, teachers in Daviess County School District and Franklin County School District completed the ADHD-SRS. Teachers returned all completed rating scales to the coordinators, who then mailed the scales back to the author. All regular education teachers at the elementary school level were asked to collect data. In middle schools and high schools, however, only English or language arts teachers were recruited to participate. This was done to prevent a student from having a rating scale completed on him or her twice by different teachers in different classrooms. The subject of English was chosen because it was assumed that the majority of students in middle school and high school were required to take a course in English or language arts each year.

The teachers who participated in this research were also asked to send home a

packet with each child in their class containing rating scales for the parents to complete (see Appendix E). A business-reply envelope was enclosed so that parents mailed their scales directly back to the author. A parent letter was included in all of the parent packets explaining the purpose of the study, the procedures that were to be followed, the voluntary nature of the parents' participation, and confidentiality issues. The parents were either given a packet with only the child information sheet and ADHD-SRS to complete, or they received a packet requesting that they complete the child information sheet, the ADHD-SRS, and the AD/HD Rating Scale-IV, home version. Coordinators were responsible for providing teachers with these packets (provided by the author).

Children's names were not put on the rating scales. Identification numbers were assigned to the scales and the teachers were asked to match the numbers on the scales they completed to the scales the parents received so that for those children on whom both a parent and a teacher completed a scale, the results could be matched. Numbers were also coordinated for teachers filling out the scales a second time 2 weeks later. On parent-rating scales that were not to be matched with the teacher scales, no code numbers were used.

CHAPTER IV

RESULTS

Data Analysis

A coding system was developed by the author and committee chair to systematically code the information included in each protocol, and to aid in the analyses (see Appendix F). The coding system was designed to include each subject's demographic information and the item responses given by the parent or teacher rater. It included a coding dictionary and instructions to the coder, which were used to standardize the coding procedure. The coding dictionary included: (a) a list of the variable names, (b) a description of each variable, and (c) the number of columns in the data set each variable would span. This format was used to facilitate data entry into a computer statistical package, SPSS for Windows (1993). ADHD-SRS item responses were assigned a number value based on an interval scale (i.e., behavior does not occur = 0, behavior occurs one to several times a month = 1, behavior occurs one to several times a week = 2, etc.). Four different versions of the coding dictionary were developed for each facet of this research: (a) a main coding dictionary for only the ADHD-SRS data, (b) a coding dictionary for the test-retest data for the ADHD-SRS, (c) a coding dictionary for the ADHD-SRS and the AD/HD Rating Scale-IV data, and (d) a coding dictionary for the ADHD-SRS and the CTRS-39 data. The coding dictionaries were identical in terms of the coding of the demographic data for each subject and for the coding of the ADHD-SRS item responses. ADHD-SRS protocols missing more than four item responses were not coded.

Descriptive Statistics

The first research question investigated in this study was: What are the descriptive statistics in the preliminary standardization sample for both parent and teacher responses? Means and standard deviations were calculated for both the parent and the teacher data to answer this question. These results are displayed in Table 4. As shown, the parent ratings had a slightly higher mean than the teacher ratings.

Concordance of Responses

The second research question addressed by this present study was: What is the concordance of parent and teacher ratings of the same children with this measure, as demonstrated by correlations of parent and teacher rated total scores? This question was investigated by conducting a Pearson product-moment correlation between the parent- and teacher-rated total scores. A grade-by-gender breakdown of the portion of the sample rated by both parent and teachers is provided in Table 5. The product-moment correlation between parent and teacher ratings was .12, $p = .581$. The r^2 (coefficient of determination) value of the correlation between the parent and teacher ratings is .01, indicating that 1% of the variability in the parent ratings is attributable to variability in the teacher ratings. The r^2 statistic is considered to be an important measure of correlation in terms of the significance or practical meaning of relationships because it expresses the percentage of variability between two sets of scores (Howell, 1982).

Table 4

Descriptive Statistics for Both Parent and Teacher Ratings on the ADHD-SRS

Ratings	n	Means	SD	Minimum	Maximum
Parent	509	43.08	38.80	.00	196.00
Teacher	240	38.08	49.12	.00	205.00

Table 5

Gender-by-Grade Breakdown of the Parent- and Teacher-Rated Subjects

	Grade							
Gender	1	2	3	4	5	7	8	Total
Male	4	1	1	1	1	3	0	11
Female	4	3	1	0	1	1	2	12
Total	8	4	1	1	2	4	2	23

Effect Size Calculations and t Tests

To answer the third major research question (Are there significant gender differences as demonstrated by parent and teacher responses on this instrument?), t tests and effect size estimates were calculated.

As shown in Table 6, parents' ratings of subjects on the ADHD-SRS were significantly different for male and female subjects, $t(505.45) = 2.25$, $p = .025$. Male subjects obtained a higher mean rating on the ADHD-SRS (46.85) than did female subjects, (39.13). Teachers' ratings were also significantly different for male and female

Table 6

Effect Size Correlations and t Tests Between Teacher- and Parent-Rated Male and Female Subjects

	Males		Females					
Rater	M	SD	M	SD	t	df	p	ES
Parent	46.85	39.88	39.13	37.39	2.25	505.45	.025	.20
Teacher	47.28	54.86	28.20	40.08	3.09	225.03	.002	.40

subjects, $t(225.03) = 3.09$, $p = .002$. Male subjects obtained a higher mean rating (47.28), than did female subjects (28.20) for teacher ratings on the ADHD-SRS.

Effect size estimates were then calculated between the male and female samples for both parent and teacher ratings to help determine the practical meaning of the score differences. This procedure was done by using the standard procedure of dividing the difference in group means by the pooled standard deviation for both groups. Results are shown in Table 6. For the parent ratings, males were rated approximately one fifth of a standard deviation higher on the ADHD-SRS than were females (ES = .20). For the teacher ratings, males were rated more than one third of a standard deviation higher than were females (ES = .40). According to Cohen's (1988) paradigm for effect size power analysis, these effect size differences are both considered to be of a small magnitude.

Relationship of Age on ADHD-SRS Ratings

The fourth research question investigated was: What is the effect of children's ages

on the ADHD-SRS scores for parent and teacher respondents? Pearson bivariate correlations were computed between the ages of the subjects and the total scores they received by parents and teachers. As shown in Table 7, as the subjects get older, their obtained scores by parent and teacher raters on the ADHD-SRS go down. The correlation coefficients obtained for both parent and teacher raters were statistically significant, but small. The r^2 value of the correlations is .04, indicating that 4% of the variability of the subjects' total scores is attributable to the variability of subjects' ages for both parent and teacher ratings.

Means and standard deviations for the ADHD-SRS total scores for children and adolescents rated by parents and teachers at three separate grade levels (K-5, 6-8, 9-12) were also calculated. As shown in Table 8, generally as the subjects get older, their obtained total scores on the ADHD-SRS become lower. There was, however, a slight increase in the mean total score from the 6-8 grade level to the 9-12 grade level for the teacher ratings. Effect size estimates were calculated for these data and are presented in Tables 9 and 10. Effect sizes were largest between the K-5 and 9-12 grade levels.

Internal Consistency Reliability

The fifth research question addressed by this study was: What is the internal consistency reliability of this behavior rating scale with parent and teacher respondent populations? Cronbach's coefficient alpha was calculated to answer this question. Alpha coefficients were computed for all ADHD-SRS items (i.e., the ADHD-SRS total score) using 438 parent ratings and 220 teacher ratings. These coefficients are

Table 7

Pearson Bivariate Correlation Coefficients Between Subject Age and Obtained ADHD-SRS Total Score Ratings for Parent and Teacher Raters

Source	r	p
Parent (N = 508)	-.21	<.001
Teacher (N = 230)	-.21	<.001

Table 8

Means and Standard Deviations for the ADHD-SRS Total Score by Grade Level

	Parent ratings			Teacher ratings		
Grade Level	n	M	SD	n	M	SD
K-5	399	47.16	40.29	133	47.59	55.58
6-8	52	37.75	30.98	27	24.85	47.17
9-12	56	18.09	21.42	80	26.67	32.58

presented in Table 11. The obtained alpha coefficient for the parent data for the ADHD-SRS total score was .98, whereas the alpha coefficient for the teacher data was .99.

Temporal Stability

The sixth research question investigated in this study was: What is the temporal stability (test-retest reliability) of this measure at a short-term (2-week) time interval with teachers? This question was addressed by calculating a Pearson product-moment

Table 9

Effect Size Estimates Matrix for the Means and Standard Deviations for the ADHD-SRS Total Scores by Grade Level--Parent Ratings

	Effect sizes		
Grade level	K-5	6-8	9-12
K-5		.26 (small)	.94 (large)
6-8			.75 (medium)

Table 10

Effect Size Estimates Matrix for the Means and Standard Deviations for the ADHD-SRS Total Scores by Grade Level--Teacher Ratings

	Effect sizes		
Grade level	K-5	6-8	9-12
K-5		.44 (small)	.77 (large)
6-8			.20 (medium)

Table 11

Internal Consistency (alpha) Coefficients for Both Parent and Teacher Ratings for the ADHD-SRS Total Score

Rater	Alpha
Parent	.98
Teacher	.99

Table 12

Means and Standard Deviations for the Test-Retest Data

Week	Cases	M	SD
Time 1	78	32.69	49.27
Time 2	78	33.38	51.53

correlation between scores of two administrations of the ADHD-SRS. The resulting coefficient for the ADHD-SRS total score was .57. The means and standard deviations for both administrations are presented in Table 12.

Factor Analysis

The seventh major research question investigated was: What is the underlying factor structure of this instrument for both parent and teacher respondent population ratings based on exploratory factor analyses? Exploratory factor analyses provide an empirical basis for reducing many items in an instrument to a few factors by statistically combining items that are moderately or highly correlated with each other (Borg & Gall, 1989). When a factor is identified in this manner, it is assumed that the items are tapping the same psychological construct. Factor analysis is useful for the development of new measures because the factors can be used as potential subscales for the measure (Lanyon & Goodstein, 1982).

Exploratory factor analyses of the ADHD-SRS were conducted for both the parent

and teacher ratings, using both oblique and orthogonal rotations in the initial analyses. Based on the minimum 4:1 or 5:1 (subjects to variables) ratio commonly used in exploratory factor analysis (Floyd & Widaman, 1995), a minimum of 224-280 subjects was necessary for these analyses.

Parent Ratings

The factor analyses for parent ratings were conducted after the first large wave of data was collected. A total of 399 parent ratings had been collected, with 361 mother and 38 father respondents. Protocols that were missing item responses were excluded from the parent-factor analyses, resulting in a total of 335 parent ratings used in the parent-factor analyses. This sample size exceeds a 5:1 ratio of subjects to items. Several factor analytic methods were used to investigate the factor structure of the parent ratings. Principal component analyses with both varimax and oblimin rotations were conducted. One common determination of how many factors to extract in a factor analysis is to extract factors with eigenvalues greater than 1.00 (Tabachnik & Fidell, 1989). This was the guideline used to determine how many factors to extract in the initial analyses of this study wherein the computer selected how many factors to extract.

First, a principal component analysis varimax (orthogonal) rotation was conducted wherein the computer selected how many factors to extract. This analysis converged in eight iterations, resulting in a five-factor structure that contained 45 double loadings and did not appear to be clinically interpretable. Next, principal component analyses using varimax rotations with four factors specified, three factors specified, and

two factors specified were conducted. All of these analyses resulted in between 41 and 46 double loadings and did not appear to be clinically interpretable.

After conducting the orthogonal (varimax) rotations, oblique (direct oblimin) rotations were used. Again, only factors with eigenvalues greater than 1.00 were extracted in the initial analysis. A principal component direct oblique rotation, with the computer selecting how many factors to extract, converged in 18 iterations, producing five factors with 15 double loadings. One factor contained only three items, and the clinical utility of the pattern matrix was questionable. Next, a principal component four-factors specified direct oblique rotation was conducted. This rotation converged in nine iterations and resulted in 19 double loadings. The fourth factor in this rotation only accounted for 2.4% of the variance, and the clinical interpretability of the resulting structure was questionable. A principal component three-factors-specified direct oblique rotation converged in 12 iterations and resulted in 13 double loadings. The third factor of this rotation appeared weak as it accounted for only 3.5% of the variance. A principal component two-factors-specified direct oblique rotation resulted in the fewest double loadings and appeared to be the most clinically interpretable.

The two-factors-specified principal component oblique rotation converged in nine iterations and resulted in nine double loadings. The first factor, consisting of 40 items, accounted for 52.3% of the explained variance (eigenvalue = 29.30). This factor was labeled Hyperactive-Impulsive as it consisted primarily of items relating to hyperactivity and impulsivity (e.g., "restless or overactive," "makes excessive noise," "blurts out," "has difficulty waiting turn in line"). The second factor, consisting of 25 items, accounted for

6.1% of the explained variance (eigenvalue = 3.42). This factor was labeled Inattention as it primarily consisted of items related to being inattentive (e.g., is disorganized with school work or homework assignments, "is forgetful [forgets things]," "has difficulty remaining on task," "does not organize activities"). The factor structure of this rotation is presented in Table 13. The correlation between the factors was .66.

Teacher Ratings

The factor analyses for the teacher ratings were conducted after the first large wave of data was collected. A total of 240 teacher ratings had been collected. Protocols that were missing item responses were excluded from the teacher-factor analyses, resulting in a total of 222 teacher ratings used in the teacher-sample factor analyses. This sample size is approximately at a 4:1 ratio between subjects to items. Several factor analytic methods were used to investigate the factor structure of the teacher ratings. Principal component analyses with both varimax and oblimin rotations were conducted. Again, initially only factors with eigenvalues greater than 1.00 were extracted (Tabachnik & Fidell, 1989).

First, a principal component analysis using a varimax (orthogonal) rotation was conducted, wherein the computer selected how many factors to extract. This analysis converged in 13 iterations, resulting in a five-factor structure that contained 46 double loadings and did not appear to be clinically interpretable. Next, principal component analyses using varimax rotations with four factors specified, three factors specified, and

Table 13

Two-Factor Oblique Rotation Factor Structure for Parent Ratings

Item	Factor 1	Factor 2
1) Has a short attention span	.37	.45
2) Talks too much	.74	
3) Loses things that he/she needs		.53
4) Needs to have questions and directions repeated		.53
5) Has difficulty delaying gratification	.46	
6) Fidgets and squirms	.71	
7) Gets "out of control" when playing	.75	
8) Makes excessive noise	.88	
9) Bothers others when they are trying to work or play	.64	
10) Unable to tolerate delays	.66	
11) Becomes overexcited	.82	
12) Blurts out	.83	
13) Rushes through chores or tasks	.45	
14) Does not hear all of what has been said	.37	.50
15) Has difficulty sitting appropriately on furniture	.57	
16) Does not prepare for school assignments		.78
17) Rocks in seat	.73	
18) Has difficulty waiting in turn in line	.79	
19) Restless or overactive	.84	
20) Has difficulty following rules of games or activities	.46	.39
21) Shifts from one activity to another	.50	.34
22) Does not follow the necessary steps in order to complete things		.61
23) Makes odd or annoying noises	.68	
24) Produces messy or sloppy school work		.77
25) Has difficulty sustaining play activities	.31	.36
26) Does not organize activities		.78
27) Leaves seat without permission	.55	
28) Does not finish projects that he/she has started		.74
29) Has difficulty remaining on task		.75
30) Make careless mistakes		.71
31) Runs in the halls/runs in the house	.57	

(table continues)

Item	Factor 1	Factor 2
32) Does not follow directions	.30	.61
33) Interferes with other's activities	.60	
34) Is easily distracted	.38	.55
35) Asks irrelevant questions	.51	
36) Does not seem to listen to what others are saying	.46	.45
37) Dislikes doing things that require sustained mental effort		.77
38) Is forgetful (forgets things)		.78
39) Interrupts others when they are talking	.64	
40) Calls out answers before the question is finished	.77	
41) Has difficulty taking turns	.71	
42) Has difficulty remaining seated	.66	
43) Is inattentive	.41	.52
44) Talks at inappropriate times	.82	
45) Acts as if "driven by a motor"	.87	
46) Gives up easily		.59
47) Has difficulty concentrating		.67
48) Always "on the go"	.80	
49) Cannot find things that he/she needs		.59
50) Moves about unnecessarily	.71	
51) Has difficulty playing or working quietly	.80	
52) Moves about while seated	.69	
53) Fails to complete school work or homework		.90
54) Shifts position in seat	.62	
55) Is disorganized with school work or homework		.91
56) Climbs on things	.64	
Percent of variance	52.5	6.1
Correlation between two factors = .66		

Note. Factor loadings of less than .30 are left blank.

two factors specified were conducted. All of these analyses resulted in between 44 and 47 loadings and did not appear to be clinically interpretable.

After conducting the orthogonal (varimax) rotations, oblique (direct oblimin) rotations were conducted. Again, only factors with eigenvalues greater than 1.00 were extracted. A principal component direct oblique rotation, with the computer selecting

how many factors to extract, converged in 41 iterations, resulting in five factors and 21 double loadings. Together, the third, fourth, and fifth factors in this rotation only accounted for 7% of the variance, and the clinical utility of this pattern matrix was questionable. Next, a principal component four-factors-specified direct oblique rotation was conducted. This rotation converged in 32 iterations and resulted in 14 double loadings. Together, the third and fourth factors in this rotation only accounted for 5% of the variance, and the clinical interpretability of this rotation was questionable. A principal component three-factors-specified direct oblique rotation converged in 21 iterations and resulted in 10 double loadings. The third factor of this rotation appeared weak as it contained only six items and it accounted for only 2.8% of the variance. A principal component two-factors-specified direct oblique rotation resulted in the fewest double loadings and appeared to be the most clinically interpretable.

The two-factors-specified principal component oblique rotation converged in eight iterations and resulted in six double loadings. The first factor, consisting of 35 items, accounted for 63.5% of the explained variance (eigenvalue = 35.57). This factor was labeled Hyperactive-Impulsive as it consisted primarily of items relating to hyperactivity and impulsivity (e.g., "acts as if driven by a motor," "becomes overexcited," "blurts out," "has difficulty waiting turn in line"). The second factor, consisting of 27 items, accounted for 7.5% of the explained variance (eigenvalue of 4.20). This factor was labeled Inattention as it primarily consisted of items related to being inattentive (e.g., "fails to complete school work or homework," "has a short attention

span," "has difficulty remaining on task," "is inattentive"). The factor structure of this rotation is presented in Table 14. The correlation between the two factors was .69.

Relationship of the Factor Structure to DSM-IV Categories

The eighth research question addressed by this present study was: What is the relationship of the factor structure obtained through exploratory factor analyses to the DSM-IV categories for ADHD? This question was investigated by qualitatively examining how similar the obtained parent- and teacher-rating factor structures of the ADHD-SRS are to the DSM-IV (APA, 1994) for ADHD.

Both the parent- and the teacher-rating factor structures for the ADHD-SRS appear, upon visual inspection, to be fairly similar to the categories listed in the DSM-IV (APA, 1994) for ADHD. The factor structure for both the parent and the teacher ratings allowing for the best fit of the data for the ADHD-SRS was a two-factor structure. Factor 1 in this structure was named Hyperactive-Impulsive as many of the items that loaded on this factor involved hyperactive or impulsive behaviors. Factor 2 in this structure was named Inattention as many of the items that loaded on this factor involved inattentive behaviors. Thus, the factor structure for the ADHD-SRS is very similar to the two DSM-IV (APA, 1994) categories listed for ADHD: inattention and hyperactivity-impulsivity. Furthermore, many of the items that loaded on either Factor 1 or Factor 2 for the ADHD-SRS are very similar to the symptoms listed in each of the two DSM-IV (APA, 1994) categories. Therefore, the optimum factor solutions for the ADHD-SRS appear to have

Table 14

Two-Factor Oblique Rotation Factor Structure for Teacher Ratings

Item	Factor 1	Factor 2
1) Has a short attention span		.83
2) Talks too much	.58	
3) Loses things that he/she needs		.77
4) Needs to have questions and directions repeated		.70
5) Has difficulty delaying gratification	.70	
6) Fidgets and squirms	.58	.37
7) Gets "out of control" when playing	.86	
8) Makes excessive noise	.78	
9) Bothers others when they are trying to work or play	.63	
10) Unable to tolerate delays	.81	
11) Becomes overexcited	.89	
12) Blurts out	.98	
13) Rushes through chores or tasks	.76	
14) Does not hear all of what has been said		.67
15) Has difficulty sitting appropriately on furniture	.70	
16) Does not prepare for school assignments		.91
17) Rocks in seat	.73	
18) Has difficulty waiting in turn in line	.89	
19) Restless or overactive	.76	
20) Has difficulty following rules of games or activities	.72	
21) Shifts from one activity to another	.48	.44
22) Does not follow the necessary steps in order to complete things		.76
23) Makes odd or annoying noises	.66	
24) Produces messy or sloppy school work	.37	.52
25) Has difficulty sustaining play activities	.67	
26) Does not organize activities		.68
27) Leaves seat without permission	.67	
28) Does not finish projects that he/she has started		.95
29) Has difficulty remaining on task		.91
30) Make careless mistakes		.67
31) Runs in the halls/Runs in the house	.88	
32) Does not follow directions		.73
33) Interferes with other's activities	.62	.32

(table continues)

Item	Factor 1	Factor 2
34) Is easily distracted		.74
35) Asks irrelevant questions	.62	
36) Does not seem to listen to what others are saying		.67
37) Dislikes doing things that require sustained mental effort		.81
38) Is forgetful (forgets things)		.76
39) Interrupts others when they are talking	.88	
40) Calls out answers before the question is finished	.99	
41) Has difficulty taking turns	.87	
42) Has difficulty remaining seated	.73	
43) Is inattentive		.82
44) Talks at inappropriate times	.61	
45) Acts as if "driven by a motor"	.97	
46) Gives up easily		.70
47) Has difficulty concentrating		.84
48) Always "on the go"	.82	
49) Cannot find things that he/she needs		.74
50) Moves about unnecessarily	.61	.32
51) Has difficulty playing or working quietly	.73	
52) Moves about while seated	.60	.31
53) Fails to complete school work or homework		1.03
54) Shifts position in seat	.69	
55) Is disorganized with school work or homework		.95
56) Climbs on things	.71	
Percent of variance	63.5	7.5
Correlation between two factors = .69		

Note. Factor loadings of less than .30 are left blank.

substantial overlap or convergence with the DSM-IV (APA, 1994) categories of inattention and hyperactivity-impulsivity.

Convergent Validity

The final research question addressed in this study was: What is the convergent validity of this instrument as demonstrated by correlations with two previously validated

behavior rating scales? This question was investigated by calculating Pearson product-moment correlation coefficients between the ADHD-SRS and (a) the CTRS-39 and (b) the AD/HD Rating Scale-IV, home and school versions.

Conner's Teacher Rating Scale

The sample for the correlational comparison between the CTRS-39 and the ADHD-SRS included teacher ratings of 42 children. A gender-by-grade breakdown of these subjects is provided in Table 15. Data were obtained for grades K-3 only. The six subscales of the CTRS-39, Hyperactivity Index, and total score were correlated with the total score of the ADHD-SRS.

The Conduct Problem subscale on the CTRS-39 correlated at .83 with the ADHD-SRS total score. The Emotional-Indulgent subscale correlated at .79 with the ADHD-SRS. The Asocial subscale was found to correlate at .78 with the total score of the ADHD-SRS, while the Anxious-Passive subscale only correlated at .26. The Daydream-Attention Problem subscale correlated at .70 with the ADHD-SRS. The Hyperactivity subscale on the CTRS-39 was found to correlate at .98 with the ADHD-SRS total score. Similarly, the CTRS-39 Hyperactivity Index correlated at .97 with the total score of the ADHD-SRS. The total scores for the CTRS-39 and the ADHD-SRS were found to correlate at .95. The r^2 value of the correlation between the total scores of the two measures is .90, indicating 90% shared variance. These data, along with the means and standard deviations for these data, are located in Table 16.

Table 15

Gender-by-Grade Breakdown for the Teacher-Rated Subjects for the CTRS-39

	Grade				
Gender	K	1	2	3	Total
Male	3	8	4	9	24
Female	0	8	5	5	18
Total	3	16	9	14	42

Table 16

Means and Standard Deviations for the CTRS-39 and the ADHD-SRS, with Correlations Between the Scores of the Two Measures

Scale	Cases	M	SD	Correlations with ADHD-SRS
Hyperactivity	42	12.19	13.13	.98
Conduct problems	42	5.36	81.50	.83
Emotional-indulgent	42	4.26	4.79	.79
Anxious-passive	42	3.98	3.30	.26
Asocial	42	2.26	2.88	.78
Daydream-attention problem	42	2.17	2.23	.70
Hyperactivity index	42	7.14	7.75	.97
CTRS-39 total score	42	22.05	21.08	.95
ADHD-SRS total score	42	53.71	61.59	

AD/HD Rating Scale-IV

The sample for the correlational comparison between the AD/HD Rating Scale-IV, home and school versions and the ADHD-SRS included ratings of 129 children and adolescents (43 subjects rated by parents and 89 subjects rated by teachers). Separate analyses were conducted for both parent and teacher ratings. The two subscales of the AD/HD Rating Scale-IV (Inattention and Hyperactivity-Impulsivity) and total score were correlated with the total score of the ADHD-SRS.

Forty mothers, two fathers, and one grandparent completed both the AD/HD Rating Scale-IV and the ADHD-SRS on their child. A gender-by-grade breakdown of the parent-rated subjects is provided in Table 17. The Inattention Scale on the AD/HD Rating Scale-IV was found to correlate at .89 with the ADHD-SRS total score. The Hyperactivity-Impulsivity Scale correlated at .86 with the ADHD-SRS total score. The total scores for the AD/HD Rating Scale-IV and the ADHD-SRS were found to correlate at .91. The r^2 value of the correlation between the total scores is .83, indicating 83% shared variance. Means and standard deviations for the parent-rated subject data are provided in Table 18.

A gender-by-grade breakdown of the teacher-rated subject data is provided in Table 19. For the teacher-rated subjects, the Inattention Scale on the AD/HD Rating Scale-IV was found to correlate at .84 with the ADHD-SRS total score, and the Hyperactivity- Impulsivity Scale correlated at .88 with the ADHD-SRS. The total scores for the AD/HD Rating Scale-IV and the ADHD-SRS were found to correlate at .94. The r^2 value of the correlation between the total scores of the two measures is .88, indicating

Table 17

Gender-by-Grade Breakdown for the Parent-Rated Subjects for the AD/HD Rating Scale-IV

	Grade			
Gender	K-5	6-8	9-12	Total
Male	12	4	0	16
Female	21	6	0	27
Total	33	10	0	43

Table 18

Means and Standard Deviations for the AD/HD Rating Scale-IV and the ADHD-SRS Parent Ratings, with Correlations Between the Scores of the Two Measures

Scale	Cases	M	SD	Correlations with ADHD-SRS
Inattention scale	43	6.42	6.18	.89
Hyperactivity-impulsivity scale	43	5.47	6.52	.86
AD/HD Rating Scale-IV total score	43	11.88	12.14	.91
ADHD-SRS total score	43	47.35	47.83	

that they share 88% of their variance. Means and standard deviations for the teacher-rated subject data are provided in Table 20.

Table 19

Gender-by-Grade Breakdown for the Teacher-Rated Subjects for the AD/HD Rating Scale-IV

	Grade			
Gender	K-5	6-8	9-12	Total
Male	18	7	13	38
Female	30	8	10	48
Total	48	15	23	86

Table 20

Means and Standard Deviations for the AD/HD Rating Scale-IV and the ADHD-SRS Teacher Ratings, with Correlations Between the Scores of the Two Measures

Scale	Cases	M	SD	Correlations with ADHD-SRS
Inattention scale	86	4.29	6.18	.84
Hyperactivity-impulsivity scale	86	6.55	7.17	.88
AD/HD Rating Scale-IV total score	86	10.85	12.11	.94
ADHD-SRS total score	86	37.50	45.30	

CHAPTER V

DISCUSSION

The primary purpose of this dissertation was to investigate the factor structure and psychometric properties of a new behavior rating scale developed for the assessment of Attention-Deficit/Hyperactivity Disorder in children, the ADHD-SRS. The specific objectives were (a) to obtain a preliminary normative sample of both parent and teacher ratings of child behavior with this scale and (b) to obtain reliability and validity evidence for this measure.

The nine specific research questions addressed in this study were (a) What are the descriptive statistics in the preliminary standardization sample for both parent and teacher responses? (b) What is the concordance of parent and teacher ratings of the same children with this measure, as demonstrated by correlations of parent and teacher related total scores? (c) Are there significant gender differences as demonstrated by parent and teacher responses on this instrument? (d) What is the effect of children's ages on the ADHD-SRS scores for parent and teacher respondents? (e) What is the internal consistency reliability of this behavior rating scale with parent and teacher respondent population? (f) What is the temporal stability of this measure at a short-term (2-week) time interval with teachers? (g) What is the underlying factor structure of this instrument for both parent and teacher respondent population ratings based on exploratory factor analyses? (h) What is the relationship of the factor structure obtained through exploratory factor analyses to the DSM-IV (APA, 1994) categories for ADHD? and (i) What is the convergent validity of

this instrument as demonstrated by correlations with two previously validated behavior rating scales?

The study objectives and research questions, along with their respective findings and clinical implications, are discussed in this chapter. Limitations of the current study, as well as recommendations for future research, are also discussed.

Concordance of Parent and Teacher Ratings

In a meta-analysis by Achenbach, McConaughy, and Howell (1987), it was found that the average correlation obtained in most studies for cross-informant ratings (i.e., parent/teacher ratings on the same child) was .28. In this study, a Pearson product-moment correlation between parent and teacher ratings on the ADHD-SRS was only .12. Though this correlation still indicates a small association between ratings, it is smaller than the average correlation reported by Achenbach et al. (1987). There are several possibilities for why such a low correlation was found. First, it is possible that the parent and the teacher rating scales were not correctly matched up, either by the coordinator, the teacher, or the rater. This problem would obviously introduce error, which could likely produce a low correlation. In addition, only 23 subjects were obtained for this specific cell of this study. Therefore, this low correlation may simply be due to random fluctuations in error variance due to a small N. This potential problem is discussed further in the Limitations section. In sum, it appears as though parent and teacher ratings on the ADHD-SRS are more discordant than found with other rating scales also designed

to measure ADHD. Further investigation must be done to confirm or disconfirm this study's findings.

Gender Differences

There was a general tendency for boys to be rated higher on the ADHD-SRS than girls of the same age. This tendency was true for both parent and teacher responses and was evidenced at all grade levels. These differences are also reflected in the literature with the higher prevalence rate of ADHD found for boys than for girls (Barkley, 1990). In addition, other rating scales currently used to assess for ADHD among the school-age population have also found this phenomenon of males receiving higher subscale and total score ratings than for females of the same age (Conners, 1990; DuPaul et al., 1996).

It should also be noted that parents' mean ratings of females (39.13) was higher than teachers' mean ratings of females (28.20) on the ADHD-SRS. This finding could be due to the idea that inattentive behaviors are underrecognized in girls by teachers because girls do not present as being as much of a managment problem in the classroom to the extent that boys are (McGee & Feehan, 1991). It is also possible that parents may rate their female children more severely than do teachers, as parents do not have a classroom of children by which they can compare their children's behaviors as teachers do.

Effect of Ages on Parent and Teacher Ratings

As evidenced by the data, as the subjects get older, their obtained scores by parent and teacher raters on the ADHD-SRS go down. In other words, subjects' obtained total

scores on the ADHD-SRS became smaller at later grade levels (i.e., K-12). This finding should not be surprising. In later childhood and adolescence, there is often a decline in ADHD symptomatology as reported on behavior rating scales (Barkley, 1996). This phenomenon may be due to a change in an individual's symptomatology (i.e., from "hyperactivity" to "a feeling of inner restlessness"), or it may be that adolescents with ADHD are able to develop adaptive coping skills to help them better manage their symptomatology. In any case, this phenomenon of decreasing scores on ADHD behavior rating scales with age has been well documented (Barkley, 1996; Sleator, 1986).

Internal Consistency Reliability

The obtained alpha coefficients for the ADHD-SRS total score for parent and teacher ratings were .98 and .99, respectively. Virtually any general guideline for interpreting internal consistency coefficients would indicate that these internal consistency reliability estimates reflect very strong internal consistency reliability for the ADHD-SRS. High internal consistency means that each item in the ADHD-SRS is tapping the same construct (i.e., ADHD; Mitchell & Jolley, 1988).

Temporal Stability

The test-retest reliability coefficient for the ADHD-SRS at a 2-week time interval was modest (.57). The temporal stability coefficient of other measures that are also designed to measure ADHD tend to be higher than that which was found for the ADHD-SRS. For example, the test-retest reliability for the CTRS-39 has been reported to range

from .72 to .91 at 1-month intervals (Conners, 1990), while the temporal stability of the AD/HD Rating Scale-IV has been found to be at .75 for a 4-week interval (DuPaul et al., 1996). There are several possible reasons for why such a low correlation was found. First, because the investigators did not personally give verbal instructions to the teachers, it is unknown how well the teachers understood the instructions for filling out the rating scales. For example, though the teachers were given fairly clear written instructions, if the teachers did not understand that the ADHD-SRS had to be completed on the same child for the second administration, a low correlation between administrations would be expected. It is also unknown how much time and effort was put into completing the rating scales. When respondents hurriedly fill out rating scales, biases can be introduced such as response sets. Finally, it is unclear if the teachers turned in the data within the exact 2-week time period specified for the study, or whether some data may have been turned in late. If rating scales were turned in late, this study would no longer be measuring the temporal stability of the ADHD-SRS at an exact 2-week time interval. Additional research with more experimental control is necessary to confirm or disconfirm these findings.

Factor Structure

For both the parent and teacher respondent populations, it appears as though a direct oblique two-factors-specified rotation is the most appropriate and clinically interpretable factor structure for the ADHD-SRS. This two-factors-specified oblique rotation had the fewest double loadings of any of the other oblique or orthogonal

rotations. Factor 1 and Factor 2 were named Hyperactive-Impulsive and Inattention, respectively, following a visual inspection of the content of the items which loaded on each factor. Factor 1 consisted of 40 items in the parent data analyses and 35 items in the teacher data analyses primarily relating to hyperactivity and impulsivity (i.e., "makes excessive noise," "blurts out," "fidgets and squirms," "restless or overactive"). Factor 2 consisted of 25 items in the parent data analyses and 27 items in the teacher data analyses primarily relating to inattention (i.e., "has a short attention span," "has difficulty remaining on task," "is inattentive," "fails to complete homework or school work").

One finding of this factor rotation that should be mentioned is the moderate correlation that was obtained between the two factors for both parent and teacher samples. This finding suggests that hyperactivity, impulsivity, and inattentiveness are not distinct, separate behaviors, but instead are somewhat interrelated. In essence, these results support ADHD as a construct.

It is also important to discuss the inherent hazards of using factor analysis for item analysis. The methods of factor analysis were originally developed for the analysis of subscales, and items have different properties that may influence factor analysis results. Gorsuch (1997) mentioned four ways in which items differ from subscales that would influence factor analysis results: (a) items have lower reliabilities than scales, (b) items often contain confounding variance in addition to the construct that is being measured, (c) item distributions often differ from each other, and (d) item scores are almost always a set of ordered categories (not continuous). Gorsuch's (1997) recommendations for compensating for some of these limitations include obtaining a sample population

consisting of people similar to those with whom the scale will be eventually used, using a large sample size, and computing several factor analyses (not just using the default analysis provided in most statistical programs). This research project attempted to incorporate these recommendations to the fullest extent possible.

Relationship to DSM-IV

The two-factor structure obtained for the ADHD-SRS appears to be remarkably similar to the DSM-IV (APA, 1994) categories for ADHD. A relatively objective visual inspection of the items that loaded on each factor and their relationship to the DSM-IV (APA, 1994) categories was conducted. Because the DSM-IV (APA, 1994) categories for ADHD were originally used as a guideline for the ADHD-SRS item inclusion, each item on the ADHD-SRS had previously been categorized into one of the two DSM-IV (APA, 1994) ADHD categories.

In this study, if the items that loaded on each factor appeared to be directly related to the corresponding DSM-IV (APA, 1994; i.e., "is inattentive" is related to the DSM-IV category of inattention, but "fidgets and squirms" is related to the category of hyperactivity-impulsivity), then that item would be counted as being directly related to the corresponding DSM-IV (APA, 1994) category. Percentages of these corresponding items were calculated for each factor for both the parent and the teacher data.

The majority of the items that loaded on each factor appeared to be directly related to the corresponding DSM-IV (APA, 1994) category (i.e., the items which loaded on the Hyperactive-Impulsive Factor primarily represent the DSM-IV [APA, 1994] ADHD

category of hyperactivity-impulsivity, not the category of inattention). For the factor structure for the parent ratings, 78% of the items that loaded on Factor 1 (Hyperactive-Impulsive) appear to be directly related to the DSM-IV (APA, 1994) category of hyperactivity-impulsivity. For Factor 2 of this factor structure (Inattention), 100% of the items appear to be directly related to the DSM-IV (APA, 1994) category of inattention. For the teacher-ratings factor structure, 83% of the items that loaded on Factor 1 (Hyperactive- Impulsive) appear to be directly related to the corresponding DSM-IV (APA, 1994) category of hyperactivity-impulsivity. Finally, for Factor 2 (Inattention) of the teacher-ratings factor structure, 85% of the items appear to be directly related to the DSM-IV (APA, 1994) category of inattention. It is important to note that almost all of the ADHD-SRS items that did not correspond to the appropriate DSM-IV (APA, 1994) ADHD category for each factor were double loadings (i.e., they loaded on both Factors 1 and 2). The majority of these double-loaded items loaded higher on the factor with which they appeared to belong (i.e., "moves about unnecessarily" loaded at .61 on Factor 1 [Hyperactive-Impulsive], while they only loaded at .32 on Factor 2 [Inattention]).

These similarities of the ADHD-SRS two-factor structure with the DSM-IV (APA, 1994) categories provide further face validity for the ADHD-SRS as the current criteria used to diagnose ADHD in the childhood population are the categories located in the DSM-IV (APA, 1994) for ADHD. These similarities should be expected as the ADHD-SRS used the DSM-IV (APA, 1994) ADHD categories as a guideline for item inclusion.

Convergent Validity

In this study, correlational comparisons of the ADHD-SRS were made with two behavior rating scales also designed to measure ADHD symptomatology: (a) the CTRS, and (b) the AD/HD Rating Scale-IV. The obtained convergent validity results are discussed separately for each comparison.

Conners' Teacher Rating Scale

The total score correlation between the CTRS-39 and the ADHD-SRS was positive and high. Thus, overall both rating scales appear to be measuring a very similar construct. Most of the correlations between the Conners subscales and the ADHD-SRS total score could be characterized as moderate to strong (.70-.98). The subscale that correlated the highest with the ADHD-SRS was the Hyperactivity subscale (.98). This finding adds support to the existing evidence that the ADHD-SRS is in fact measuring ADHD symptomatology. The Hyperactivity Index also correlated highly with the ADHD-SRS (.97). In addition, the Conduct Problem subscale on the CTRS-39 correlated quite high (.83) with the ADHD-SRS total score. This finding is consistent with the literature that indicates a high comorbidity between ADHD and oppositional and conduct disordered behaviors (Barkley, 1990; Frick & Lahey, 1991). The Anxious-Passive subscale, however, only had a weak correlation with the ADHD-SRS (.26). This finding is to be expected as the Anxious-Passive subscale clearly appears to be measuring a different construct (i.e., leadership skills and submissivness) than the ADHD-SRS.

AD/HD Rating Scale-IV

Resulting correlations for the parent data between the ADHD-SRS total score and the AD/HD Rating Scale-IV subscales and total score were positive and were quite strong in magnitude. Similarly, the teacher data correlations between the total score and subscale scores for the AD/HD Rating Scale-IV and the ADHD-SRS total score were found to correlate highly. These findings are not surprising since both behavior rating scales were developed using the DSM-IV (APA, 1994) criteria either as a guideline for item inclusion (the ADHD-SRS), or as the items themselves (the AD/HD Rating Scale-IV). The AD/HD Rating Scale-IV and the ADHD-SRS appear to be measuring the same general construct. Therefore, these findings provide strong support for the construct validity of the ADHD-SRS as a measure of attention problems and hyperactivity-impulsivity.

Clinical Implications of This Research

This research involved the investigation of a new behavior rating scale designed to assess for ADHD in children and adolescents, namely the ADHD-SRS. Currently there is a lack of psychometrically adequate and clinically useful assessment measures designed to specifically identify ADHD in the childhood population. The ADHD-SRS appears to be a viable ADHD assessment tool for eventual clinical use.

The ADHD-SRS has several advantages over many currently existing rating scales. One advantage is that the items for the ADHD-SRS are based on the DSM-IV (APA, 1994) conceptualization of ADHD and its symptomatology. Also, this rating scale

contains 56 items designed purely to assess for ADHD characteristics, thus generating a more thorough and complete assessment. The results of this research indicate that the ADHD-SRS possesses strong internal consistency. Convergent validity of this instrument was also high, as demonstrated by correlations with two previously validated behavior rating scales. In agreement with the literature, significant age and gender differences in ADHD symptoms were found with both the parent- and teacher-respondent populations. The factor analysis of the ADHD-SRS suggested a two-factor oblique rotation as the best fit for both the parent and teacher data. After a visual inspection of the items that loaded on each factor, Factor 1 was named Hyperactive-Impulsive and Factor 2 was named Inattention. These two factors, along with the items that loaded on each factor, appear to be remarkably similar to the two categories listed in the DSM-IV (APA, 1994) for ADHD. These results add further face validity for the ADHD-SRS. This preliminary evidence, along with the research previously conducted on the development and content validation of this instrument (Holland, 1997), indicates that the ADHD-SRS will eventually be a clinically useful tool for assessment of ADHD with children and adolescents.

Another clinical implication of this research is the moderately strong correlation of the ADHD-SRS total score to the Conduct Problem subscale on the CTRS-39. This finding is consistent with the literature, which indicates a high comorbidity between ADHD and oppositional and conduct disordered behaviors (Barkley, 1990; Frick & Lahey, 1991). Thus, these results add to the mounting evidence of the strong relationship between Conduct Disorder and ADHD. Clinically it is important to understand this

comorbidity when attempting to make a differential diagnosis between the two disorders.

Finally, this research adds support to the two DSM-IV (APA, 1994) ADHD categories, hyperactivity-impulsivity and inattention. The ADHD-SRS used the DSM-IV (APA, 1994) categories for ADHD as a guideline for item inclusion. Through exploratory factor analyses with the ADHD-SRS items, a two-factor structure was deemed the most clinically interpretable solution. Upon visual inspection of the items that loaded on each factor, the factors were named Hyperactive-Impulsive and Inattention. Thus, this research helps to substantiate the two DSM-IV (APA, 1994) categories for ADHD and provides further evidence that the DSM-IV (APA, 1994) is an empirically supportable classification method for diagnosing ADHD in children and adolescents.

Limitations

In addition to the findings of this research, some potential limitations should be addressed. First, the nature of the sample used in the preliminary normative group may limit the generalizability of the results. Though an attempt was made to collect data from several different states within the U.S., almost half of the sample for this research was obtained in northern Utah. Thus, this preliminary normative group should not be considered to be representative of the general U.S. population. Ideally, a more representative sample of children and adolescent ratings from various areas of the United States, who are stratified on important demographic characteristics (i.e., ethnicity, socioeconomic status, etc.), should have been used.

Second, more experimental control should have been used in the test-retest reliability study. The test-retest reliability coefficient obtained in this study for the ADHD-SRS was low in comparison with the test-retest reliability coefficients of other rating scales also designed to measure ADHD. Though it is unknown why such a low correlation was found, it is possible that the weak experimental control in collecting the data may have affected the results. More experimental control (i.e., the investigators verbally giving the instructions to the teachers) should have been used. In addition, it is also possible that the frequency of behavior rating format of the ADHD-SRS influenced the results. Because very few behavior rating scales utilize such a rating format, it is unknown if this format is so specific (i.e., "behavior occurs one to several times an hour") that it would naturally produce a low test-retest correlation. More research should be done to determine if the rating format affected the results.

A final limitation of this study is the low experimental control that was used when conducting the correlational research between parent and teacher ratings. It is possible that the parent and teacher protocols were not appropriately matched up, and more experimental control (i.e., perhaps clearer instructions for the coordinators and teachers) could have been attempted. In addition to this limitation, a small sample size ($\underline{N} = 23$) was used to calculate the parent-teacher correlation. Ideally, an $\underline{N}$ of at least 30 should have been used. This low $\underline{N}$ may also have contributed to the low correlation found due to random fluctuations in error variance. Finally, it is possible that the ADHD-SRS's frequency of behavior rating format affected the correlation between parent and teacher ratings. It may be that this rating format is somehow very situation and setting specific

and, thus, parents and teachers would rate children differently. More research should be conducted to determine if the rating format did influence these results.

Directions for Future Research

The results of the preliminary normative sample provide some evidence for the reliability, validity, and factor structure of the ADHD-SRS. Furthermore, this research has provided the foundation for additional research with the ADHD-SRS. At this point, the ADHD-SRS should be considered an experimental research instrument. The development of national norms, additional reliability and validity studies, and optimum clinical cutoff points are necessary before this instrument should be used for clinical assessment of children and adolescents.

To confirm or disconfirm the findings of this research, it is necessary to replicate the test-retest reliability research utilizing more experimental control. It may be necessary for the investigators to take a more active role in collecting the data. For example, the investigators could personally give verbal and written standardized instructions to the teachers regarding how to fill out the rating scales. The investigators should also use more control over the deadline when the completed rating scales must be turned in (i.e., exactly 2 weeks).

The correlation between parent and teacher ratings should also be replicated using more experimental control. Again, it may be necessary for the investigators to personally give standardized instructions to the teachers to ensure that the parent- and teacher-rating scales are correctly matched up. In addition, a larger sample size must be

collected to eliminate any random fluctuations in error variance due to a small N.

In addition to the exploratory factor analyses run in this research project, confirmatory factor analyses should also be conducted. In contrast to exploratory factor analysis, confirmatory factor analysis is frequently used to confirm a priori hypotheses based on theory or results from previous analyses (Floyd & Widaman, 1995; Tabachnick & Fidell, 1989). Confirmatory factor analyses are generally noted by the absence of factor rotation (Comrey & Lee, 1992). Confirmatory factor analysis is a primary method for demonstrating construct validity, not for data reduction. Construct validity is supported if the factor structure of the scales in the instrument is consistent with the constructs the instrument is purported to measure (Floyd & Widaman, 1995).

Research should also be conducted on the sensitivity of the ADHD-SRS to treatment changes with children with ADHD. This research could be accomplished through pre- and posttesting of subjects either before and after medication administration or before and after implementation of behavior management techniques. Treatment sensitivity is another way in which the construct validity of a test may be demonstrated (Anastasi, 1988). Research should also be conducted on the differences between parent- and teacher-rated ADHD-SRS scores for clinic-referred and nonreferred children and adolescents.

In addition to these future directions in research with the ADHD-SRS, some potential future directions in assessment should also be considered. In general, it is the best practice that rating scales not be used alone for making classification or placement decisions, but instead that they be used as part of a multimethod, multisetting,

multisource design for obtaining a broad-based and aggregated assessment (Merrell, 1994). Therefore, perhaps where the future lies for the assessment of ADHD is not to expand on our already existing repertoire of behavior rating scales and other assessment methods being used, but instead to develop a new method of assessment for ADHD that is more thorough and efficient. In the meantime, however, it is important to keep the current assessment tools as up to date and psychometrically sound as possible.

Summary

In conclusion, this research project resulted in an investigation of the psychometric properties and factor structure of a new behavior rating scale designed to measure ADHD, the ADHD-SRS. Additional studies of the ADHD-SRS's test-retest reliability, concordance of parent and teacher ratings, criterion validity, treatment sensitivity, and confirmatory factor analyses, as well the development of national norms, are needed before this rating scale can be considered appropriate for clinical use.

The development and refinement of psychometrically adequate and clinically useful assessment measures are important to help accurately identify and diagnose ADHD in the childhood and adolescent populations. However, it is imperative that a link be established between ADHD assessment and specific intervention strategies. Future research that builds upon this present study should address this link in order to increase the development and effectiveness of interventions and treatments to the childhood and adolescent populations diagnosed with ADHD.

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APPENDICES

Appendix A:

ADHD Symptoms Rating Scale

(ADHD-SRS)

Instructions:
After you have completed the child information section, please read each item carefully and decide how often you think this child has demonstrated these behaviors in the past 3 months. If you have had no opportunity to observe the child engaging in a particular behavior or have no knowledge about the item, please mark **Behavior Does Not Occur.** Please complete all items.

	Behavior Does Not Occur	Behavior Occurs One To Several Times A Month	Behavior Occurs One To Several Times A Week	Behavior Occurs One To Several Times A Day	Behavior Occurs One To Several Times An Hour
1) Has a short attention span	☐	☐	☐	☐	☐
2) Talks too much	☐	☐	☐	☐	☐
3) Loses things that he/she needs	☐	☐	☐	☐	☐
4) Needs to have questions and directions repeated	☐	☐	☐	☐	☐
5) Has difficulty delaying gratification	☐	☐	☐	☐	☐
6) Fidgets and squirms	☐	☐	☐	☐	☐
7) Gets "out of control" when playing	☐	☐	☐	☐	☐
8) Makes excessive noise	☐	☐	☐	☐	☐
9) Bothers others when they are trying to work or play	☐	☐	☐	☐	☐
10) Unable to tolerate delays	☐	☐	☐	☐	☐
11) Becomes overexcited	☐	☐	☐	☐	☐
12) Blurts out	☐	☐	☐	☐	☐
13) Rushes through chores or tasks	☐	☐	☐	☐	☐
14) Does not hear all of what has been said	☐	☐	☐	☐	☐
15) Has difficulty sitting appropriately on furniture	☐	☐	☐	☐	☐
16) Does not prepare for school assignments	☐	☐	☐	☐	☐
17) Rocks in seat	☐	☐	☐	☐	☐
18) Has difficulty waiting in turn in line	☐	☐	☐	☐	☐
19) Restless or overactive	☐	☐	☐	☐	☐
20) Has difficulty following rules of games or activities	☐	☐	☐	☐	☐
21) Shifts from one activity to another	☐	☐	☐	☐	☐
22) Does not follow the necessary steps in order to complete things	☐	☐	☐	☐	☐
23) Makes odd or annoying noises	☐	☐	☐	☐	☐
24) Produces messy or sloppy school work	☐	☐	☐	☐	☐
25) Has difficulty sustaining play activities	☐	☐	☐	☐	☐
26) Does not organize activities	☐	☐	☐	☐	☐

	Behavior Does Not Occur	Behavior Occurs One To Several Times a Month	Behavior Occurs One To Several Times a Week	Behavior Occurs One To Several Times a Day	Behavior Occurs One To Several Times an Hour
27) Leaves seat without permission	☐	☐	☐	☐	☐
28) Does not finish projects that he/she has started	☐	☐	☐	☐	☐
29) Has difficulty remaining on task	☐	☐	☐	☐	☐
30) Makes careless mistakes	☐	☐	☐	☐	☐
31) Runs in the halls/ Runs in the house	☐	☐	☐	☐	☐
32) Does not follow directions	☐	☐	☐	☐	☐
33) Interferes with others' activities	☐	☐	☐	☐	☐
34) Is easily distracted	☐	☐	☐	☐	☐
35) Asks irrelevant questions	☐	☐	☐	☐	☐
36) Does not seem to listen to what others are saying	☐	☐	☐	☐	☐
37) Dislikes doing things that require sustained mental effort	☐	☐	☐	☐	☐
38) Is forgetful (forgets things)	☐	☐	☐	☐	☐
39) Interrupts others when they are talking	☐	☐	☐	☐	☐
40) Calls out answers before the question is finished	☐	☐	☐	☐	☐
41) Has difficulty taking turns	☐	☐	☐	☐	☐
42) Has difficulty remaining seated	☐	☐	☐	☐	☐
43) Is inattentive	☐	☐	☐	☐	☐
44) Talks at inappropriate times	☐	☐	☐	☐	☐
45) Acts as if "driven by a motor"	☐	☐	☐	☐	☐
46) Gives up easily	☐	☐	☐	☐	☐
47) Has difficulty concentrating	☐	☐	☐	☐	☐
48) Always "on the go"	☐	☐	☐	☐	☐
49) Cannot find things that he/she needs	☐	☐	☐	☐	☐
50) Moves around unnecessarily	☐	☐	☐	☐	☐
51) Has difficulty playing or working quietly	☐	☐	☐	☐	☐
52) Moves about while seated	☐	☐	☐	☐	☐
53) Fails to complete school work or homework	☐	☐	☐	☐	☐
54) Shifts position in seat	☐	☐	☐	☐	☐
55) Is disorganized with school work or homework assignments	☐	☐	☐	☐	☐
56) Climbs on things	☐	☐	☐	☐	☐

Appendix B:

Sample Letter to the Coordinators

Utah State
UNIVERSITY
Department of Psychology
Logan, Utah 84322-2810
Telephone: (801) 797-1460
FAX: (801) 797-1448

Dear Coordinator,

Thank you again for agreeing to collect data in your district. Here is some information regarding the study. The purpose of this study is to gather preliminary normative information (what are typical responses) as well as validity (does the scale measure what it is supposed to) and reliability (are results consistent over time) data on a new instrument designed to assess for Attention Deficit Hyperactivity Disorder (ADHD) in children. To do this, we are asking approximately 1300 parents and 400 teachers to complete this scale on children in grades K-12. There are no foreseen risks or discomforts associated with participation in this study, as all information will be collected confidentially and no identifying information (i.e., names) of the child, parent, or teacher will be put on the forms. In addition, it should take only take approximately 20 to 30 minutes for parents and teachers to participate in this study. This study was approved by the Human Research Board at Utah State University and was given "Exempt" status as there are no foreseen risks for the participants and no permission is required by the parents to obtain this anonymous data.

In order to coordinate such a massive amount of data across the country, we have spoken with individuals in the school districts, like yourself, who would like to help with this research. Enclosed with this letter are the study procedures that will need to be followed, along with a sample packet that will be distributed, by you, to teachers in your district. What we would need you to do is to drop off these packets and explain to the teachers what they will need to do. The teachers will be instructed to give out the parent packets to all of the children in their classroom to take home. The parents will send the packets directly back to us here in Utah when they have completed them (if they decide to participate). Obviously, this would take some of your time and we have some incentives for coordinators: 1) You will be paid $5 for each teacher who participates (so, for example, if you have 20 participating teachers in your district, you would receive $100); 2) if you are NCSP certified you can receive continuing education hours; 3) you will be able to have unlimited use of this rating scale until it is published (if that occurs); and 4) if the scale is commercially published you will receive complimentary copies of the manual and protocols.

Thank you again for agreeing to help us. I will be in touch with you in the next several weeks. Hopefully by that time we can get approval to collect this data in your district. I

will keep you updated. Please also feel free to contact me if you have any questions or concerns by calling me at (801) 755-0565 or by writing to me at the above address. Thanks again!

Sincerely,

Melissa Lea Holland
Doctorate Student
Utah State University

Appendix C:

Sample Letter to the District Superintendents

Utah State
UNIVERSITY
Department of Psychology
Logan, Utah 84322-2810
Telephone: (801) 797-1460
FAX: (801) 797-1448

Superintendent
School District
Street Address
City, State Zip

January 13, 1997

Dear Superintendent,

I am writing to request your consideration in allowing data to be collected in your district on a new behavior rating scale designed to assess for Attention Deficit Hyperactivity Disorder (ADHD) in children. The purpose of this study is to gather preliminary normative information (what are typical responses) as well as validity (does the scale measure what it is supposed to) and reliability (are results consistent over time) data on this new instrument. To do this, we are asking approximately 1300 parents and 400 teachers to complete this scale on children in grades K-12. There are no foreseen risks or discomforts associated with participation in this study, as all information will be collected confidentially and no identifying information (i.e., names) of the child, parent, or teacher will be put on the forms. In addition, it should take only take approximately 30 minutes for parents and teachers to participate in this study. This study was approved by the Human Research Board at Utah State University and was given "Exempt" status as there are no foreseen risks for the participants and no permission is required by the parents to obtain this anonymous data.

In order to coordinate such a massive amount of data across the country, the researchers have spoken with individuals in the school districts who would be eager to help with this research. For your district, Jane Doe, who works as a school psychologist for your school district, has agreed to coordinate the data. Any questions directly related with this research you may direct at me at 801-755-0565 or at the number listed at the top of this letter.

Enclosed with this letter, you will find the specific study procedures that will be followed during collection of this data, along with a sample packet which will be given to the parents and teachers who agree to participate in this research. It is stated in the letters to the teachers and parents that their participation is entirely voluntary and that the decision

of whether or not to participate will have no impact on job status or the educational placement of the child.

This research will benefit those involved in the assessment and treatment of ADHD by developing a scale which is designed to be used specifically to assess ADHD in children. Your agreeing to allow data to be collected in your district will be extremely important to this research. If you do decide to allow data collection, your school will be acknowledged in the manual upon publication (if this occurs) as having contributed to the development of the national normative sample and the reliability and validity data.

Thank you for your time and consideration with regard to this request. Please feel free to contact me if you have any questions or concerns about the research. I will get in touch with you shortly after you receive this correspondence to discuss this request further.

Sincerely,

Melissa Lea Holland, M.S.
Research Investigator and Doctoral Student
Utah State University

Appendix D:

Sample Teacher Packet

Utah State
UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
Logan, Utah 84322-2810
Telephone: (801) 797-1460
FAX: (801) 797-1448

TEACHER CONSENT FORM

Purpose of study:
The purpose of this study is to gather information on a newly developed scale intended to be used in the assessment of attention deficit hyperactivity disorder (ADHD) in children.

Procedures that will be followed:
As a participant in this study you will be asked to complete rating scales on 3-5 children in one of your classes. If you complete rating scales on 5 children, you will be asked to complete only one rating scale per child. If you complete rating scales on 3 children, you will be asked to complete either two rating scales per child at the same time or one rating scale per child and then a second rating scale per child 2-weeks later. In addition, you will be asked to send home with the children in one of your classes a packet to the parents containing rating scales and a letter of explanation regarding the study. You will return your rating scales to the researchers in a stamped-addressed envelope. The parents will return their information directly to the researchers.

Discomforts/Risks
There are no apparent risks to participating in this study. It should take you approximately 10 minutes to complete each rating scale.

Benefits to participants:
Although there are not expected to be any direct benefits to you as a participant, this research will benefit those involved in the assessment and treatment of ADHD by developing a scale which is designed to be used specifically to assess ADHD in children.

Confidentiality:
All information obtained from you will be held confidential. You will not put your name on any forms. Forms will be coded but the code numbers associated with you will be kept by the principal investigator and will not be shared with anyone.

Other Information:
If you have additional questions about this study or your rights, or if any problems arise you may contact one of the following investigators:

Gretchen Gimpel	(801) 797-0721
Ken Merrell	(801) 797-2034
Melissa Holland	(801) 755-0565

Your participation in this study is entirely voluntary and you may discontinue your participation at any time without consequence. Non-participation or withdrawal from this study will in no way affect your job or other benefits to which you are otherwise entitled.

I have read and understand this consent form and I am willing to participate in this study.
Name of participant_____
Signature of participant_____
Date_____

Child Information

Grade: _____ Age: _____ Sex: _____

Ethnicity/Race: _____

Classroom type at school:

Regular ☐ Remedial ☐ Special Education ☐

Does this child receive special education services?

Yes ☐ No ☐

If yes, please list the special education service category

(LD, MR, BD, etc.): _____

Has this child ever been diagnosed with ADHD?

Yes ☐ No ☐ Don't Know ☐

Occupation of Child's Parent(s) (if known):

Mother: _____

Father: _____

Relationship of Rater to the Child:

Mother ☐ Father ☐ Teacher ☐

Other ☐ _____

(please specify)

Instructions:
After you have completed the child information section, please read each item carefully and decide how often you think this child has demonstrated these behaviors in the past 3 months. If you have had no opportunity to observe the child engaging in a particular behavior or have no knowledge about the item, please mark **Behavior Does Not Occur.** Please complete **all** items.

	Behavior Does Not Occur	Behavior Occurs One To Several Times A Month	Behavior Occurs One To Several Times A Week	Behavior Occurs One To Several Times A Day	Behavior Occurs One To Several Times An Hour
1) Has a short attention span	☐	☐	☐	☐	☐
2) Talks too much	☐	☐	☐	☐	☐
3) Loses things that he/she needs	☐	☐	☐	☐	☐
4) Needs to have questions and directions repeated	☐	☐	☐	☐	☐
5) Has difficulty delaying gratification	☐	☐	☐	☐	☐
6) Fidgets and squirms	☐	☐	☐	☐	☐
7) Gets "out of control" when playing	☐	☐	☐	☐	☐
8) Makes excessive noise	☐	☐	☐	☐	☐
9) Bothers others when they are trying to work or play	☐	☐	☐	☐	☐
10) Unable to tolerate delays	☐	☐	☐	☐	☐
11) Becomes overexcited	☐	☐	☐	☐	☐
12) Blurts out	☐	☐	☐	☐	☐
13) Rushes through chores or tasks	☐	☐	☐	☐	☐
14) Does not hear all of what has been said	☐	☐	☐	☐	☐
15) Has difficulty sitting appropriately on furniture	☐	☐	☐	☐	☐
16) Does not prepare for school assignments	☐	☐	☐	☐	☐
17) Rocks in seat	☐	☐	☐	☐	☐
18) Has difficulty waiting in turn in line	☐	☐	☐	☐	☐
19) Restless or overactive	☐	☐	☐	☐	☐
20) Has difficulty following rules of games or activities	☐	☐	☐	☐	☐
21) Shifts from one activity to another	☐	☐	☐	☐	☐
22) Does not follow the necessary steps in order to complete things	☐	☐	☐	☐	☐
23) Makes odd or annoying noises	☐	☐	☐	☐	☐
24) Produces messy or sloppy school work	☐	☐	☐	☐	☐
25) Has difficulty sustaining play activities	☐	☐	☐	☐	☐
26) Does not organize activities	☐	☐	☐	☐	☐

	Behavior Does Not Occur	Behavior Occurs One To Several Times a Month	Behavior Occurs One To Several Times a Week	Behavior Occurs One To Several Times a Day	Behavior Occurs One To Several Times an Hour
27) Leaves seat without permission	☐	☐	☐	☐	☐
28) Does not finish projects that he/she has started	☐	☐	☐	☐	☐
29) Has difficulty remaining on task	☐	☐	☐	☐	☐
30) Makes careless mistakes	☐	☐	☐	☐	☐
31) Runs in the halls/ Runs in the house	☐	☐	☐	☐	☐
32) Does not follow directions	☐	☐	☐	☐	☐
33) Interferes with others' activities	☐	☐	☐	☐	☐
34) Is easily distracted	☐	☐	☐	☐	☐
35) Asks irrelevant questions	☐	☐	☐	☐	☐
36) Does not seem to listen to what others are saying	☐	☐	☐	☐	☐
37) Dislikes doing things that require sustained mental effort	☐	☐	☐	☐	☐
38) Is forgetful (forgets things)	☐	☐	☐	☐	☐
39) Interrupts others when they are talking	☐	☐	☐	☐	☐
40) Calls out answers before the question is finished	☐	☐	☐	☐	☐
41) Has difficulty taking turns	☐	☐	☐	☐	☐
42) Has difficulty remaining seated	☐	☐	☐	☐	☐
43) Is inattentive	☐	☐	☐	☐	☐
44) Talks at inappropriate times	☐	☐	☐	☐	☐
45) Acts as if "driven by a motor"	☐	☐	☐	☐	☐
46) Gives up easily	☐	☐	☐	☐	☐
47) Has difficulty concentrating	☐	☐	☐	☐	☐
48) Always "on the go"	☐	☐	☐	☐	☐
49) Cannot find things that he/she needs	☐	☐	☐	☐	☐
50) Moves around unnecessarily	☐	☐	☐	☐	☐
51) Has difficulty playing or working quietly	☐	☐	☐	☐	☐
52) Moves about while seated	☐	☐	☐	☐	☐
53) Fails to complete school work or homework	☐	☐	☐	☐	☐
54) Shifts position in seat	☐	☐	☐	☐	☐
55) Is disorganized with school work or homework assignments	☐	☐	☐	☐	☐
56) Climbs on things	☐	☐	☐	☐	☐

Connor's Rating Scales

Instructions: Read each item below carefully, and decide how much you think the child has been bothered by this problem during the past month.

Not at All	Just a Little	Pretty Much	Very Much	CTRS-39
				CLASSROOM BEHAVIOR
0	1	2	3	1. Constantly fidgeting
0	1	2	3	2. Hums and makes other odd noises
0	1	2	3	3. Demands must be met immediately - easily frustrated
0	1	2	3	4. Coordination poor
0	1	2	3	5. Restless or overactive
0	1	2	3	6. Excitable, impulsive
0	1	2	3	7. Inattentive, easily distracted
0	1	2	3	8. Fails to finish things s/he starts - short attention span
0	1	2	3	9. Overly sensitive
0	1	2	3	10. Overly serious or sad
0	1	2	3	11. Daydreams
0	1	2	3	12. Sullen or sulky
0	1	2	3	13. Cries often and easily
0	1	2	3	14. Disturbs other children
0	1	2	3	15. Quarrelsome
0	1	2	3	16. Mood changes quickly and drastically
0	1	2	3	17. Acts 'smart'
0	1	2	3	18. Destructive
0	1	2	3	19. Steals
0	1	2	3	20. Lies
0	1	2	3	21. Temper outbursts, explosive and unpredictable behavior
				GROUP PARTICIPATION
0	1	2	3	22. Isolates him/herself from other children
0	1	2	3	23. Appears to be unaccepted by group
0	1	2	3	24. Appears to be easily led
0	1	2	3	25. No sense of fair play
0	1	2	3	26. Appears to lack leadership
0	1	2	3	27. Does not get along with opposite sex
0	1	2	3	28. Does not get along with same sex
0	1	2	3	29. Teases other children or interferes with their activities
				ATTITUDE TOWARD AUTHORITY
0	1	2	3	30. Submissive
0	1	2	3	31. Defiant
0	1	2	3	32. Impudent
0	1	2	3	33. Shy
0	1	2	3	34. Fearful
0	1	2	3	35. Excessive demands for teacher's attention
0	1	2	3	36. Stubborn
0	1	2	3	37. Overly anxious to please
0	1	2	3	38. Uncooperative
0	1	2	3	39. Attendance problem

Not at All	Just a Little	Pretty Much	Very Much

BEHAVIOR RATING SCALE-SCHOOL VERSION

Circle the number that best describes this student's school behavior over the past 6 months (or since the beginning of the school year).

	Never or Rarely	Sometimes	Often	Very Often
1. Fails to give close attention to details or makes careless mistakes in schoolwork.	0	1	2	3
2. Fidgets with hands or feet or squirms in seat.	0	1	2	3
3. Has difficulty sustaining attention in tasks or play activities.	0	1	2	3
4. Leaves seat in classroom or in other situations in which remaining seated is expected.	0	1	2	3
5. Does not seem to listen when spoken to directly.	0	1	2	3
6. Runs about or climbs excessively in situations in which it is inappropriate.	0	1	2	3
7. Does not follow through on instructions and fails to finish work.	0	1	2	3
8. Has difficulty playing or engaging in leisure activities quietly.	0	1	2	3
9. Has difficulty organizing tasks and activities.	0	1	2	3
10. Is "on the go" or acts as if driven by a motor.	0	1	2	3
11. Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort.	0	1	2	3
12. Talks excessively.	0	1	2	3
13. Loses things necessary for tasks and activities.	0	1	2	3
14. Blurts out answers before questions have been completed.	0	1	2	3
15. Is easily distracted.	0	1	2	3
16. Has difficulty awaiting turn.	0	1	2	3
17. Is forgetful in daily activities.	0	1	2	3
18. Interrupts or intrudes on others.	0	1	2	3

Appendix E:

Sample Parent Packet

Utah State
UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
Logan, Utah 84322-2810
Telephone: (801) 797-1460
FAX: (801) 797-1448

Dear Parent:

We are writing to you for your help in developing a new scale to look at different behaviors of children. The purpose of this project is to gather information to help us develop a new child behavior checklist.

If you would like to participate please complete the enclosed checklists and information sheet on your child and mail it back in the enclosed self-addressed, stamped envelope. These checklists describe many typical child behaviors. There is no need to be concerned if your child has some of these behaviors.

It will take 10-20 minutes to complete these checklists. You are under no obligation to complete these checklists and whether or not you do so will in no way influence your child's educational placement.

All results from this study will be completely confidential. Neither your name nor your child's name will be identified on the checklist. Please do not put your name or your child's name on these checklists.

If you have any questions about this study please contact one of us at the phone numbers listed below. If you would like results of this study when it is completed, please also let us know. Because the scales are completely confidential we cannot provide you any information on your own child.

Thank you for your time and assistance.

Sincerely,

Melissa Holland, M.S.
USU Doctoral Student
(801) 755-0565

Gretchen A. Gimpel, Ph.D.
Assistant Professor
(801) 797-0721

Child Information

Grade: _____ Age: _____ Sex: _____

Ethnicity/Race: _____

Classroom type at school:

Regular ☐ Remedial ☐ Special Education ☐

Does this child receive special education services?

Yes ☐ No ☐

If yes, please list the special education service category

(LD, MR, BD, etc.): _____

Has this child ever been diagnosed with ADHD?

Yes ☐ No ☐ Don't Know ☐

Occupation of Child's Parent(s) (if known):

Mother: _____

Father: _____

Relationship of Rater to the Child:

Mother ☐ Father ☐ Teacher ☐

Other ☐ _____

(please specify)

Instructions:
After you have completed the child information section, please read each item carefully and decide how often you think this child has demonstrated these behaviors in the past 3 months. If you have had no opportunity to observe the child engaging in a particular behavior or have no knowledge about the item, please mark **Behavior Does Not Occur**. Please complete all items.

	Behavior Does Not Occur	Behavior Occurs One To Several Times A Month	Behavior Occurs One To Several Times A Week	Behavior Occurs One To Several Times A Day	Behavior Occurs One To Several Times An Hour
1) Has a short attention span	☐	☐	☐	☐	☐
2) Talks too much	☐	☐	☐	☐	☐
3) Loses things that he/she needs	☐	☐	☐	☐	☐
4) Needs to have questions and directions repeated	☐	☐	☐	☐	☐
5) Has difficulty delaying gratification	☐	☐	☐	☐	☐
6) Fidgets and squirms	☐	☐	☐	☐	☐
7) Gets "out of control" when playing	☐	☐	☐	☐	☐
8) Makes excessive noise	☐	☐	☐	☐	☐
9) Bothers others when they are trying to work or play	☐	☐	☐	☐	☐
10) Unable to tolerate delays	☐	☐	☐	☐	☐
11) Becomes overexcited	☐	☐	☐	☐	☐
12) Blurts out	☐	☐	☐	☐	☐
13) Rushes through chores or tasks	☐	☐	☐	☐	☐
14) Does not hear all of what has been said	☐	☐	☐	☐	☐
15) Has difficulty sitting appropriately on furniture	☐	☐	☐	☐	☐
16) Does not prepare for school assignments	☐	☐	☐	☐	☐
17) Rocks in seat	☐	☐	☐	☐	☐
18) Has difficulty waiting in turn in line	☐	☐	☐	☐	☐
19) Restless or overactive	☐	☐	☐	☐	☐
20) Has difficulty following rules of games or activities	☐	☐	☐	☐	☐
21) Shifts from one activity to another	☐	☐	☐	☐	☐
22) Does not follow the necessary steps in order to complete things	☐	☐	☐	☐	☐
23) Makes odd or annoying noises	☐	☐	☐	☐	☐
24) Produces messy or sloppy school work	☐	☐	☐	☐	☐
25) Has difficulty sustaining play activities	☐	☐	☐	☐	☐
26) Does not organize activities	☐	☐	☐	☐	☐

	Behavior Does Not Occur	Behavior Occurs One To Several Times a Month	Behavior Occurs One To Several Times a Week	Behavior Occurs One To Several Times a Day	Behavior Occurs One To Several Times an Hour
27) Leaves seat without permission	☐	☐	☐	☐	☐
28) Does not finish projects that he/she has started	☐	☐	☐	☐	☐
29) Has difficulty remaining on task	☐	☐	☐	☐	☐
30) Makes careless mistakes	☐	☐	☐	☐	☐
31) Runs in the halls/ Runs in the house	☐	☐	☐	☐	☐
32) Does not follow directions	☐	☐	☐	☐	☐
33) Interferes with others' activities	☐	☐	☐	☐	☐
34) Is easily distracted	☐	☐	☐	☐	☐
35) Asks irrelevant questions	☐	☐	☐	☐	☐
36) Does not seem to listen to what others are saying	☐	☐	☐	☐	☐
37) Dislikes doing things that require sustained mental effort	☐	☐	☐	☐	☐
38) Is forgetful (forgets things)	☐	☐	☐	☐	☐
39) Interrupts others when they are talking	☐	☐	☐	☐	☐
40) Calls out answers before the question is finished	☐	☐	☐	☐	☐
41) Has difficulty taking turns	☐	☐	☐	☐	☐
42) Has difficulty remaining seated	☐	☐	☐	☐	☐
43) Is inattentive	☐	☐	☐	☐	☐
44) Talks at inappropriate times	☐	☐	☐	☐	☐
45) Acts as if "driven by a motor"	☐	☐	☐	☐	☐
46) Gives up easily	☐	☐	☐	☐	☐
47) Has difficulty concentrating	☐	☐	☐	☐	☐
48) Always "on the go"	☐	☐	☐	☐	☐
49) Cannot find things that he/she needs	☐	☐	☐	☐	☐
50) Moves around unnecessarily	☐	☐	☐	☐	☐
51) Has difficulty playing or working quietly	☐	☐	☐	☐	☐
52) Moves about while seated	☐	☐	☐	☐	☐
53) Fails to complete school work or homework	☐	☐	☐	☐	☐
54) Shifts position in seat	☐	☐	☐	☐	☐
55) Is disorganized with school work or homework assignments	☐	☐	☐	☐	☐
56) Climbs on things	☐	☐	☐	☐	☐

BEHAVIOR RATING SCALE-HOME VERSION

Circle the number that best describes this child's home behavior over the past 6 months.

	Never or Rarely	Sometimes	Often	Very Often
1. Fails to give close attention to details or makes careless mistakes in schoolwork.	0	1	2	3
2. Fidgets with hands or feet or squirms in seat.	0	1	2	3
3. Has difficulty sustaining attention in tasks or play activities.	0	1	2	3
4. Leaves seat in classroom or in other situations in which remaining seated is expected.	0	1	2	3
5. Does not seem to listen when spoken to directly.	0	1	2	3
6. Runs about or climbs excessively in situations in which it is inappropriate.	0	1	2	3
7. Does not follow through on instructions and fails to finish work.	0	1	2	3
8. Has difficulty playing or engaging in leisure activities quietly.	0	1	2	3
9. Has difficulty organizing tasks and activities.	0	1	2	3
10. Is "on the go" or acts as if driven by a motor.	0	1	2	3
11. Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort.	0	1	2	3
12. Talks excessively.	0	1	2	3
13. Loses things necessary for tasks and activities.	0	1	2	3
14. Blurts out answers before questions have been completed.	0	1	2	3
15. Is easily distracted.	0	1	2	3
16. Has difficulty awaiting turn.	0	1	2	3
17. Is forgetful in daily activities.	0	1	2	3
18. Interrupts or intrudes on others.	0	1	2	3

Appendix F:

Coding Dictionaries

ADHD-SRS CODING DICTIONARY
PRELIMINARY NORMATIVE SAMPLE

Notes to the coder: The main data file, ADHDSRS.DAT, should be done in WordPerfect and the font size should always be preset to Courier 10pt font. Missing data will be handled as follows: If the protocol is missing four or less responses, leave the missing data items BLANK. If the protocol is missing five or more responses, DO NOT code the protocol. If a subject has marked two answers for one item, code the more extremeresponse. For example, if a subject marks "Behavior occurs one to several times a day", and "Behavior occurs one to several times an hour," code the "hour" response (i.e., 4).

Variable	Description	Columns
1. ID	Protocol ID Assign and record the protocol number	1-4
2. RATER	Relationship of rater to the child 1 = Mother 2 = Father 3 = Teacher 4 = Other family member 5 = Other	5
3. SITE	Site number 01 = Weber School District, UT 02 = Westside School District, ID 03 = Eureka School District, CA 04 = Roseville School District, CA	6-7
3. GRADE	Grade of subject 00 = Kindergarten 01-12 = grades 1-12, r	8-9

6. ETHNIC	Ethnicity / Race of subject 0 = Unknown / missing 1 = Caucasian / White 2 = African American / Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American, Eskimo, or Aleut 6 = Other	13
7. CLASTYPE	Classroom type at school 1 = Regular education 2 = Remedial 3 = Special education	14
8. SPED	Does this child receive special education services 0 = no 1 = yes	15
9. SPEDCAT	List special education service category 0 = None 1 = Learning Disabled 2 = Speech language disordered / Communication Disorder 3 = Mentally retarded / Intellectual disability 4 = Emotionally or behaviorally disturbed 5 = Other health impaired 6 = Other 7 = Unknown	16
10. ADHD	Has this child ever been diagnosed with ADHD 1 = yes 2 = no 3 = Don't know	17

11. MOTHOCC	Mother's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	18
12. FATHOCC	Father' occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	19
14. CODER	Name of person coding 1 = Lisa 2 = Melissa 3 =	20

21 & 22 = Blank spaces

ITEM 1 - ITEM 56	Items on the Protocol 0 = Behavior does not occur 1 = Behavior occurs 1 to several times a month 2 = Behavior occurs 1 to several times a week 3 = Behavior occurs 1 to several times a day 4 = Behavior occurs 1 to several times an hour	23-78

ADHD-SRS CODING DICTIONARY--TEST-RETEST PRELIMINARY NORMATIVE SAMPLE

Notes to the coder: The test-retest data file, TESTRET.DAT, should be done in WordPerfect and the font size should always be preset to Courier 10pt font. Missing data will be handled as follows: If the protocol is missing four or less responses, leave the missing data items BLANK. If the protocol is missing five or more responses, DO NOT code the protocol. If a subject has marked two answers for one item, code the more extreme response. For example, if a subject marks""Behavior occurs one to several times a day," and "Behavior occurs one to several times an hour," code the "hour" response (i.e., 4). Only code the demographic data for the first administration of the ADHD-SRS for EACH student. For the second administration of the ADHD-SRS for that student, begin coding the protocol starting with Item 1 in column 23 on the line underneath the first administration. Visually, the data would look like this for each student:

DEMOGRAPHIC DATA ITEM RESPONSES (first administration)
ITEM RESPONSES (second administration)

Variable	Description	Columns
1. ID	Protocol ID Assign and record the protocol number	1-4
2. RATER	Relationship of rater to the child 1 = Mother 2 = Father 3 = Teacher 4 = Other family member 5 = Other	5
3. SITE	Site number 01 = Weber School District, UT 02 = Westside School District, ID 03 = Eureka School District, CA 04 = Roseville School District, CA	6-7
3. GRADE	Grade of subject 00 = Kindergarten 01-12 = grades 1-12, respectively	8-9
4. AGE	In years	10-11

5. SEX	Gender of subject 1 = male 2 = female	12
6. ETHNIC	Ethnicity / Race of subject 0 = Unknown / missing 1 = Caucasian / White 2 = African American / Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American, Eskimo, or Aleut 6 = Other	13
7. CLASTYPE	Classroom type at school 1 = Regular education 2 = Remedial 3 = Special education	14
8. SPED	Does this child receive special education services 0 = no 1 = yes	15
9. SPEDCAT	List special education service category 0 = None 1 = Learning Disabled 2 = Speech language disordered / Communication Disorder 3 = Mentally retarded / Intellectual disability 4 = Emotionally or behaviorally disturbed 5 = Other health impaired 6 = Other 7 = Unknown	16
10. ADHD	Has this child ever been diagnosed with ADHD 1 = yes 2 = no 3 = Don't know	17

11. MOTHOCC	Mother' occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	18
12. FATHOCC	Father's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	19
14. CODER	Name of person coding 1 = Lisa 2 = Melissa 3 =	20

21 & 22 = Blank spaces

ITEM 1 - ITEM 56	Items on the Protocol 0 = Behavior does not occur 1 = Behavior occurs 1 to several times a month 2 = Behavior occurs 1 to several times a week 3 = Behavior occurs 1 to several times a day 4 = Behavior occurs 1 to several times an hour	23-78

ADHD-SRS CODING DICTIONARY--ADHD RATING SCALE IV PRELIMINARY NORMATIVE SAMPLE

Notes to the coder: The ADHD-SRS and ADHD Rating Scale IV data file, SRSADHD4.DAT, should be done in WordPerfect and the font size should always be preset to Courier 10pt font. Missing data will be handled as follows: If the ADHD-SRS protocol is missing four or less responses, leave the missing data items BLANK. If the protocol is missing five or more responses, DO NOT code the protocol. If a subject has marked two answers for one item, code the more extreme response. For example, if a subject marks "Behavior occurs one to several times a day," and "Behavior occurs one to several times an hour," code the "hour" response (i.e., 4). Only code the demographic data once for EACH student. For the administration of the ADHD Rating Scale IV for that student, begin coding the Inattention Score on columns 23 and 24 on the line underneath the first administration. Then, code the Hyperactivity-Impulsivity Score on columns 25 and 26, and code the Total Score on columns 27 and 28. Visually, the data would look like this for each student:

DEMOGRAPHIC DATA ITEM RESPONSES (ADHD-SRS)
INATTEN. SCORE HYP-IMP. SCORE TOT. SCORE
(ADHD RS- IV)

Variable	Description	Columns
1. ID	Protocol ID Assign and record the protocol number	1-4
2. RATER	Relationship of rater to the child 1 = Mother 2 = Father 3 = Teacher 4 = Other family member 5 = Other	5
3. SITE	Site number 01 = Weber School District, UT 02 = Westside School District, ID 03 = Eureka School District, CA 04 = Roseville School District, CA	6-7
3. GRADE	Grade of subject 00 = Kindergarten 01-12 = grades 1-12, respectively	8-9
4. AGE	In years	10-11

5. SEX	Gender of subject 1 = male 2 = female	12
6. ETHNIC	Ethnicity / Race of subject 0 = Unknown / missing 1 = Caucasian / White 2 = African American / Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American, Eskimo, or Aleut 6 = Other	13
7. CLASTYPE	Classroom type at school 1 = Regular education 2 = Remedial 3 = Special education	14
8. SPED	Does this child receive special education services 0 = no 1 = yes	15
9. SPEDCAT	List special education service category 0 = None 1 = Learning Disabled 2 = Speech language disordered / Communication Disorder 3 = Mentally retarded / Intellectual disability 4 = Emotionally or behaviorally disturbed 5 = Other health impaired 6 = Other 7 = Unknown	16
10. ADHD	Has this child ever been diagnosed with ADHD 1 = yes 2 = no 3 = Don't know	17

11. MOTHOCC	Mother's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	18
12. FATHOCC	Father's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	19
14. CODER	Name of person coding 1 = Lisa 2 = Melissa 3 =	20

21 & 22 = Blank spaces

FOR THE FIRST LINE (ADHD-SRS DATA)

ITEM 1 - ITEM 56	Items on the Protocol 0 = Behavior does not occur 1 = Behavior occurs 1 to several times a month 2 = Behavior occurs 1 to several times a week 3 = Behavior occurs 1 to several times a day 4 = Behavior occurs 1 to several times an hour	23-78

FOR THE SECOND LINE (ADHD RATING SCALE IV DATA)

INATTN	Inattention Score	23-24
HYPIMP	Hyperactivity-Impulsivity Score	25-26
TOTAL	Total Score	27-28

ADHD-SRS CODING DICTIONARY--CONNER'S TEACHER RATING SCALE PRELIMINARY NORMATIVE SAMPLE

Notes to the coder: The CTRS data file, SRSCTRS.DAT, should be done in WordPerfect and the font size should always be preset to Courier 10pt font. Missing data will be handled as follows: If the ADHD-SRS protocol is missing four or less responses, leave the missing data items BLANK. If the protocol is missing five or more responses, DO NOT code the protocol. If a subject has marked two answers for one item, code the more extreme response. For example, if a subject marks "Behavior occurs one to several times a day," and "Behavior occurs one to several times an hour," code the "hour" response (i.e., 4). Only code the demographic data once for EACH student. For the administration of the Conner's Teacher Rating Scale for that student, begin coding the data on the next line on column 23. Proceed to code item by item the raw scores as found on the CTRS-39 protocol cover sheet (items 1-39 on columns 23-61). Visually, the data would look like this for each student:

DEMOGRAPHIC DATA ITEM RESPONSES (ADHD-SRS)
ITEM RESPONSES (CTRS-39)

Variable	Description	Columns
1. ID	Protocol ID Assign and record the protocol number	1-4
2. RATER	Relationship of rater to the child 1 = Mother 2 = Father 3 = Teacher 4 = Other family member 5 = Other	5
3. SITE	Site number 01 = Weber School District, UT 02 = Westside School District, ID 03 = Eureka School District, CA 04 = Roseville School District, CA	6-7
3. GRADE	Grade of subject 00 = Kindergarten 01-12 = grades 1-12, respectively	8-9
4. AGE	In years	10-11

5. SEX	Gender of subject 1 = male 2 = female	12
6. ETHNIC	Ethnicity / Race of subject 0 = Unknown / missing 1 = Caucasian / White 2 = African American / Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American, Eskimo, or Aleut 6 = Other	13
7. CLASTYPE	Classroom type at school 1 = Regular education 2 = Remedial 3 = Special education	14
8. SPED	Does this child receive special education services 0 = no 1 = yes	15
9. SPEDCAT	List special education service category 0 = None 1 = Learning Disabled 2 = Speech language disordered / Communication Disorder 3 = Mentally retarded / Intellectual disability 4 = Emotionally or behaviorally disturbed 5 = Other health impaired 6 = Other 7 = Unknown	16
10. ADHD	Has this child ever been diagnosed with ADHD 1 = yes 2 = no 3 = Don't know	17

11. MOTHOCC	Mother's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	18
12. FATHOCC	Father's occupation 0 = Missing / blank 1 = Managerial or professional worker 2 = Technical sales and administrative support worker 3 = Service workers 4 = Farming, forestry, and fishing worker 5 = Precision production worker, craftsman, repairman 6 = Operators, fabricators, and laborers 7 = Not currently in labor force, other	19
14. CODER	Name of person coding 1 = Lisa 2 = Melissa 3 =	20

21 & 22 = Blank spaces

FOR THE FIRST LINE (ADHD-SRS DATA)

ITEM 1 - ITEM 56	Items on the Protocol 0 = Behavior does not occur 1 = Behavior occurs 1 to several times a month 2 = Behavior occurs 1 to several times a week 3 = Behavior occurs 1 to several times a day 4 = Behavior occurs 1 to several times an hour	23-78

FOR THE SECOND LINE (CONNER'S TEACHER'S RATING SCALE)

CTRS 1 - CTRS 39	Items on the CTRS-39 0 (Code as per the CTRS-39 protocol cover sheet) 1 2	23-61

VITA

MELISSA LEA HOLLAND

Address: 188 West 1250 South
Logan, UT 84321
Phone: (801)755-0565

Education

Ph.D. candidate — Utah State University, Logan, Utah. (Degree Expected: May 1999).
Combined Professional-Scientific Psychology
APA Accredited Program
Specialization: Clinical, Counseling, School Psychology
Cumulative GPA: 3.95
Dissertation: *"An Investigation of the Psychometric Properties and Factor Structure of the ADHD Symptoms Rating Scale for Children and Adolescents."* Chair: Kenneth W. Merrell, Ph.D.

M.S. — Utah State University, Logan, Utah. June 1997
Counseling Psychology
Cumulative GPA: 3.94
Thesis: *"Preliminary Development and Content Validation of a Rating Scale for Assessing Attention-Deficit Hyperactivity Disorder in Children."* Chair: Kenneth W. Merrell, Ph.D.

B.A., *with honors* — University of California, Davis. June 1993
Major: Psychology
Advisor: Linda P. Acredolo, Ph.D.

Clinical Experience

Current Clinical Positions

Oct. 1996-June 1996 -&- Oct 1997-Present — Mental Health Specialist, Bear River Head Start, Logan, Utah.
Provide brief and long-term, individual and group therapy for children and their families experiencing a variety of emotional, social, and behavioral problems. Conduct preschool and psychological assessments; responsible for case management. Conduct behavioral

Current Clinical Positions (continued)

observation of children and consultation with parents and staff. Prepare and present talks and programs on wide variety of mental health topics to families and staff. **Hours:** 1440 (by June 1998). **Supervisor:** David M. Stein, Ph.D.

March 1997-Present — *Therapist*, Child Evaluation and Treatment Center, Logan, Utah. Provide individual and family therapy for children and parents. Responsible for case management. **Hours:** 55 (to date). **Supervisor:** Steven Gentry, Ph.D.

Aug. 1995-Present — *Therapist*, Psychology Community Clinic, Utah State University. Provide individual psychotherapy to adults. Conduct diagnostic evaluations and responsible for case management. **Hours:** 150 (to date). **Supervisors**: Susan Crowley, Ph.D., David M. Stein, Ph.D., Patricia L. Truhn, Ph.D.

Clinical Practica

Oct. 1997-Present — *Bear River Mental Health*, Logan, Utah. Provide individual, family and group therapy under the supervision of a licensed therapist. Utilization of play therapy techniques at a child clinic. **Hours:** 300 (by June 1998). **Supervisors:** Marilyn MacDonald, M.A., Trent Wentz, Ph.D.

Oct. 1996-June 1997 — *Utah State University Counseling Center*, Utah State University, Logan, Utah. Provided individual and group counseling under the supervision of licensed psychologists. **Hours:** 300. **Supervisors:** Gwena Couillard, Ph.D., David Bush, Ph.D., Janis Neece, Ph.D., Mary Doty, Ph.D.

Sept. 1995-June 1996 — *Weber School District*, Ogden, Utah. Administered, scored and interpreted psychoeducational assessment instruments; conducted individual psychotherapy and behavioral observations; consulted in classrooms; participated in IEP meetings and weekly staffings; worked on an interdisciplinary team within the school and mental health system. Worked with children ages 3-18. **Hours**: 300. **Supervisors:** Lila Blanch, M.S., Kenneth W. Merrell, Ph.D.

Sept. 1994-Aug. 1995 — *Psychology Community Clinic*, Department of Psychology, Utah State University, Logan, Utah. Provided individual, couples, and family

Clinical Practica (continued)

psychotherapy under the supervision of licensed clinical psychologists. Conducted diagnostic evaluations and responsible for case management. **Hours:** 400. **Supervisors:** Susan Crowley, Ph.D., David M. Stein, Ph.D.

Previous Clinical Positions

Dec. 1996-
May 1997

Therapist, Westside School District, Dayton, Idaho. Provided teacher and administrator consultation and individual counseling to high school students. **Hours:** 64. **Supervisor:** Kenneth W. Merrell, Ph.D.

June 1995-
Sept. 1996
-&-
July 1997-
Sept. 1997

Psychoeducational/Mental Health Specialist, Community Family Partnership, Center for Persons with Disabilities, Utah State University. Conducted psychoeducational and developmental assessment of children ages 1 month-10 years; provided mental health therapy to individuals and families; consulted with preschool teaching staff; trained and supervised graduate assistants in assessment methods; recruited, trained, placed and supervised volunteers for CFP Big Brother, Big Sister Program; worked on a multidisciplinary team. **Hours:** 1,400. **Supervisors**: Michaelle Ann Robinson, Ph.D., Patricia L. Truhn, Ph.D.

Sept. 1993-
Sept. 1994

Residential Counselor/Special Education Assistant, River Oak Center for Children, Sacramento, California. Provided care and assistance for severely emotionally disturbed children; counseled youth on appropriate behaviors and choices; co-led group psychotherapy; implemented behavior management techniques (i.e., token economy, behavioral charting); supervised school and residential activities; prepared daily written reports; administered and recorded medications; prone restrained resident if resident was a physical threat to self or others; worked on a multidisciplinary team. **Hours:** 2,000. **Supervisors:** John Halstead, B.A., Harry Wang, M.D.

Summer 1993

Group Home Counselor, Paradise Oaks Youth Services, Citrus Heights, California. Supervised daily activities of the residents; prepared daily written reports on residents' attitudes, behavior and personal adjustment; counseled youth on appropriate choices; administered and properly recorded medications; prone restrained a resident if resident was a physical threat to self or others. **Hours:** 480. **Supervisor:** Bill Holland, M.S.

Previous Clinical Positions (continued)

April 1992-
June 1993

Peer Counselor in Sexuality, Cowell Health Center, University of California, Davis. Counseled students about sexual attitudes, behaviors and healthy relationships, presented outreach programs, wrote articles for the university paper. **Hours:** 500. **Supervisor:** Erik Golanty, MS.

May 1992-
April 1993

Suicide Prevention Telephone Counselor of Yolo County, Davis, California. Used a crisis intervention model to counsel callers. **Hours:** 200. **Supervisor:** Carol Rodgers, MFCC.

Research Experience

July 1997-
Present

Researching the ADHD Symptoms Rating Scale (ADHD-SRS) with Gretchen A. Gimpel, Ph.D. & Kenneth W. Merrell, Ph.D., Utah State University.

Sept. 1996-
July 1997

Child clinical dissertation research with Kenneth W. Merrell, Ph.D., Utah State University. An investigation of the psychometric properties and factor structure of the ADHD Symptoms Rating Scale for children and adolescents.

June 1996-
Sept. 1996

Researched the social-emotional behavior of preschool-age children with developmental delays with Kenneth W. Merrell, Ph.D., Utah State University.

Fall 1994-
Fall 1996

Child clinical thesis research with Kenneth W. Merrell, Ph.D., Utah State University. Preliminary development and content validation of a rating scale for assessing Attention-Deficit Hyperactivity Disorder in children.

Sept. 1995-
Aug. 1996

Rural Training Grant, Department of Psychology, Utah State University. Developed area of research in rural schools. **Supervisor:** Kenneth W. Merrell, Ph.D.

Sept. 1994-
June 1995

Research Assistant, Department of Psychology, Utah State University. Conducted research on ADHD and internalizing disorders in children. Duties included library research, coding protocols on a spreadsheet program, and assisting in development and dissemination of research materials. **Supervisor:** Kenneth W. Merrell, Ph.D.

Research Experience (continued)

June 1992-
June 1993 — *Research Assistant*, Department of Psychology, University of California, Davis. Conducted research on toddler's acquisition of language. Duties included videotaping parent-child interactions, coding interactions with a time-sampling system, entering data into a spreadsheet program, and attending weekly research development meetings. **Supervisors:** Linda P. Acredolo, Ph.D., Susan Goodwyn, Ph.D.

Teaching Experience

Summer 1997 — *Teaching Assistant*, Department of Psychology, Utah State University. Workshop in Psychopharmacology. **Supervisor:** Kenneth Merrell, Ph.D.

Spring 1993 — *Teaching Assistant/Reader*, Department of Psychology, University of California, Davis. Graded assignments and examinations, held office hours for undergraduate course in Theories of Consciousness. **Supervisor:** Charles T. Tart, Ph.D.

Publications

Holland, M. L., & Merrell, K. W. (in press). Social-emotional characteristics of preschool-age children referred for child find screening and assessment: A comparative study. *Research in Developmental Disabilities.*

Merrell, K. W., & Holland, M. L. (in press). Social-emotional behavior of preschool-age children with developmental delays: A compa`rative study. *Research in Developmental Disabilities.*

Holland, M. L., Gimpel, G. A., & Merrell, K. W. (under review). Innovations in assessing ADHD: Development, psychometric properties, and factor structure of the ADHD symptoms rating scale (ADHD-SRS). *Journal of Child Clinical Psychology.*

National Presentations

Merrell, K. W., Holland, M. L., Caldarella, P., & Michael, K. D. (1997, September). *Innovations in assessing emotional and behavioral disorders of children and youth.* Symposium presented at the Seventh Annual Virginia Beach Conference: Children and Adolescents with Emotional and Behavioral Disorders, Virginia Beach, VA..

Holland, M. L., & Merrell, K. W. (1997, February). *Identification of behavioral and emotional problems of preschool and kindergarten aged children referred for assessment of developmental delays.* Poster presented at the meeting of the Utah Association of School Psychologists, Salt Lake City, UT.

Holland, M. L., & Merrell, K. W. (1996, October). *Behavioral, social, and emotional problems in preschool and kindergarten aged children: New directions in assessment and identification.* Poster presented at the meeting of the Kansas Conference in Clinical Child Psychology, Lawrence, KS.

Holland, M. L. (1996, March). *Attention-deficit hyperactivity disorder: New directions in assessment.* Poster presented at the meeting of the National Association of School Psychologists, Atlanta, GA.

Local Presentations

Holland, M. L., Boettcher, B. (1997, March). *Childhood fears: Identification and management in the classroom and home.* Staff Training, Bear River Head Start, Logan, UT..

Holland, M. L. (1997, February). *Child sexual abuse: A solution.* Classroom Presentations, Bear River Head Start, Logan, UT.

Holland, M. L. (1997, February). *Child sexual abuse: A solution for parents.* Parent Training, Bear River Head Start, Logan, UT.

Holland, M. L. (1997, January). *The mystery of ADHD.* Head Start Mini-Conference, Bear River Head Start, Logan, UT.

Holland, M. L. (1996, November). *Domestic violence: It's everybody's business.* Staff Training, Bear River Head Start, Logan, UT.

Holland, M. L. (1996, October). *Domestic violence awareness: One hit leads to another.* Parent Workshop, Bear River Head Start, Logan, UT.

Local Presentations (continued)

Holland, M. L. (1996, February). *Conflict resolution and anger management.* Parent Workshop, Bear River Head Start, Logan, UT.

Selected Conferences and Workshops Attended

"20th Annual Intervention Procedures Conference" June 16-20, 1997
Utah State University, Logan, UT

"Assessment and Treatment of Trauma" April 4, 1997
Lecture by Dr. John Briere, USU Counseling Center

"Raising Children in a Socially Toxic Environment" January 6, 1997
Lecture by James Garbarino, Logan, UT

"Conflict Resolution Techniques for Marriages and Families" Workshop, Utah State University June 20-21, 1996

"Exploring the Power of Group" April 19, 1996
Robert Weber, Ph.D.University Counseling Center, USU, Logan, UT

Utah Association of School Psychologists February 23-24, 1996
Annual Meeting, Salt Lake City, UT

Twelfth Annual Conference on Infancy and Childhood June 19 - 23, 1995
Utah State University, Logan, UT

Governor's Conference on Volunteerism April 4, 1995
Park City, UT

Certification

School Psychologist State of Utah. September 1997

Affiliations and Activities

1997-Present	*Student Affiliate*, American Psychological Association
1995-Present	*Student Affiliate*, A.P.A., Section on Clinical Child Psychology
1995-Present	*Student Affiliate*, The Society of Pediatric Psychology
1996-1997	*Graduate Student Representative*, Pro-Sci Psychology
Program,	Utah State University
1995-1996	*Graduate Student Senator*, represented the Psychology Department at Utah State University
1995-1996	*Committee Chair*, Library and Campus Issues Committee, Graduate Student Senate, Utah State University
1992-1993	*Member*, Undergraduate Psychology Association, U.C. Davis Chapter
1992-1993	*Officer*, Undergraduate Psychology Association, U.C. Davis Chapter

Honors

1997	National Dean's List
1994-Present	Graduate Student Honor Roll, Utah State University
1996	Recipient, Distinguished Service Award, Utah State University
1995-1996	Recipient, Rural Psychology Training Grant Stipend, Utah
State	University
1991-1993	Member, Psi Chi National Honor Society in Psychology
1993	Member, Phi Kappa Phi, National Honor Society for Academic Excellence
1992-1993	Dean's List, U.C. Davis
1991	Deas List, U.C. Santa Barbara